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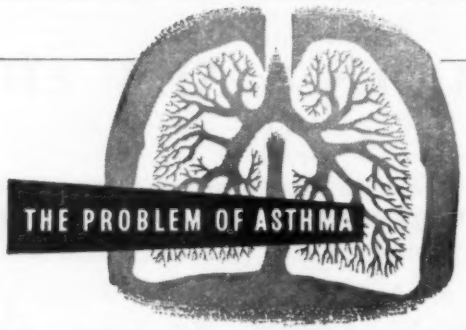

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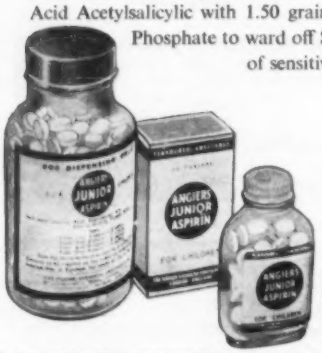

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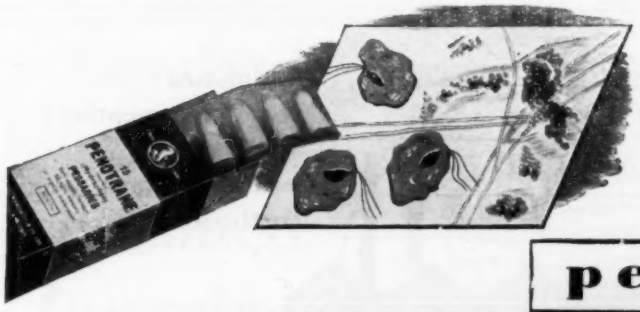

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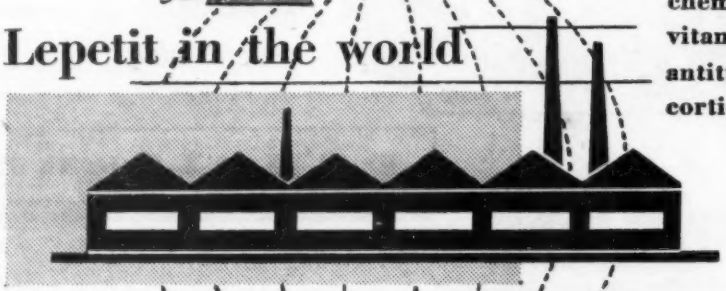

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'OVALTINE' is eminently suitable as an aid in meeting this need because it provides concentrated nourishment in a palatable and easily assimilated form. It is acceptable to the most capricious appetite, such as often occurs in pregnancy.

'OVALTINE' possesses galactogogue properties. It also aids in maintaining the strength and general well-being of the nursing mother.

THE high quality of its natural ingredients—malt, milk, cocoa, soya and eggs—its content of added vitamins, and the strictly hygienic conditions of its manufacture combine to provide a first-class nutritional product which has long enjoyed the approval of obstetricians.

OVALTINE

Vitamin Standardization per oz.—Vitamin B_1, 0.3 mg.; Vitamin D, 350 i.u.; Niacin, 2mg.

A. WANDER LIMITED, 42 Upper Grosvenor Street, Grosvenor Square, London W.1.

Manufactory, Farms and 'Ovaltine' Research Laboratories:—King's Langley, Herts.

M. 379.

Save time on urine tests with . . .

CLINITEST and ACETEST

TRADE MARK TRADE MARK

Reagent Tablets
for the detection of Glycosuria

Reagent Tablets
for the detection of Ketonuria

Both tests performed simultaneously in one minute!

Specialists, General Practitioners, Clinics and Hospitals in all parts of the country have used and prescribed 'Clinitest' Reagent Tablets since 1947. Many valuable hours have been saved. Now after intensive research work and clinical trials the makers of 'Clinitest' Reagent Tablets have produced 'Acetest' Reagent Tablets for the detection of Ketonuria. With 'Clinitest' and 'Acetest' Reagent Tablets, reliable routine sugar and acetone tests can be carried out *simultaneously* in one minute!

CLINITEST

No external heating · No measuring of reagents

Approved by the Medical Advisory Committee of the Diabetic Association. The 'Clinitest' set, refills and accessories are all available under the N.H.S. on Form E.C.10. (*Basic Drug Tariff Prices: Set 6/8 complete. Refill bottles of 36 tablets 2/4.*)

CLINITEST HOSPITAL EQUIPMENT

An invaluable time-saver in wards and clinics. Write for details and hospital prices.

The advantages of ACETEST Reagent Tablets

Quick and reliable, a single tablet provides all the reagents to perform a test. Low cost permits this tablet test to be used as a screening procedure or as a routine for diabetic patients. No danger of false positives with normal urine. No caustic reagents.

TO PERFORM A TEST:

1. **Put 1 drop of urine on tablet.**
2. **Take reading at 30 seconds. Compare tablet to colour chart provided.**
3. **Record results as negative, trace, moderate or strongly positive.**

Supplied in bottles of 100 tablets with colour scale.

'Acetest' Reagent Tablets (*diagnostic nitroprusside tabs.*) are also available under the N.H.S. on Form E.C.10. Basic Drug Tariff price 3/10 per bottle of 100 tablets (with colour scale).

REFERENCES

(1954) 'Clinical Tests for Ketonuria', *'Lancet', April 17th, pp. 801/804*
(1954) '*Medicine Illustrated*', *May, p. 289*
(1954) '*Practical Clinical Biochemistry*', *Heinemann, p. 74*
(1954) 'Clinical Tests for Ketonuria', *'Lancet', July 10th, p. 95*

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Nuffield House, Piccadilly, London, W.1. Telephone: REGent 5321
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Gypsona
TRADE MARK

has stood the test of time

Soaks more readily than hand-rolled bandages.

Sets firmly in four to five minutes.

Stronger yet less brittle than ordinary plaster.

Casts have porcelain-like surface.

Casts are porous.

Trimmed edges do not crumble and casts have a neat appearance.

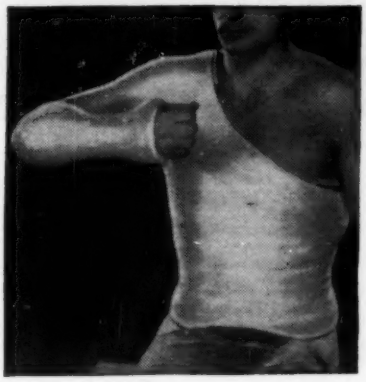
Casts may be bivalved, or cut open and sprung apart without loss of strength.

Exact number of bandages for a particular cast can be determined beforehand.

Special interlocked woven cloth permits easy moulding.

High plaster content—90% of plaster by weight.

Will keep for a very long time without deterioration when stored in a dry place.



The absence of loose powder and the non-fray edges of the specially-woven leno cloth base of Gypsona bandages provides a distinct advantage over hospital-made bandages.

In performance, the superiority of Gypsona is even more marked. The high plaster content is fixed to the fabric by a special process, and there is a negligible loss of plaster when the bandage is soaked. A surprisingly small amount of material will produce a cast which is light, but of great strength.

Gypsona is by far the most economical plaster for the modern functional treatment of fractures.

SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS (S&N) Gypsona TRADE MARK

Acute infections, surgery of the alimentary tract and the administration of antibiotics are particularly associated with impaired absorption or utilisation of the vitamin B-complex. Initial intensive therapy (oral or parenteral) is provided by Becovite, with subsequent maintenance by Befortiss.

For intensive therapy **BECOVITE B Complex**

Tablets, 2 ml. Ampoules (Boxes of 3 pairs) Elixir (6 fl. oz.)

For maintenance therapy **BEFORTISS B Complex**

Tablets, 1 ml. Ampoules (Boxes of 5) Elixir (6 fl. oz.)

PARENTROVITE *for Neuroses & Psychoses*

An injectable preparation of B vitamins and vitamin C in high concentration.

(In boxes of 3 pairs of ampoules. Hospital packs also available.)

OROVITE *for Oral use*

A preparation containing the same B-complex vitamins in high concentration, is also available.

In tablets and elixir.

VITAMINS LIMITED

(DEPT. 14) UPPER MALL, LONDON, W.6.

FULL DETAILS OF PACKS AND PRICES ON REQUEST. ALL PRESCRIBABLE ON THE N.H.S.

swift advance:

"SCLAVO" NEW OUTSTANDING DIAGNOSTIC AGENTS

TEST-ACID Sclavo

acid test for the determination of gastric acidity without catheter.

". . . the test requires no special apparatus or technique and is eminently suitable for the doctor in practice. . . . "

C-REACTIVE PROTEIN TEST Sclavo

Antiserum for the determination of C-reactive Protein in human serum.

MORE RELIABLE AND SENSITIVE THAN E.S.R.
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". . . the latest and most significant advance for the detection of inflammatory diseases. . . ."

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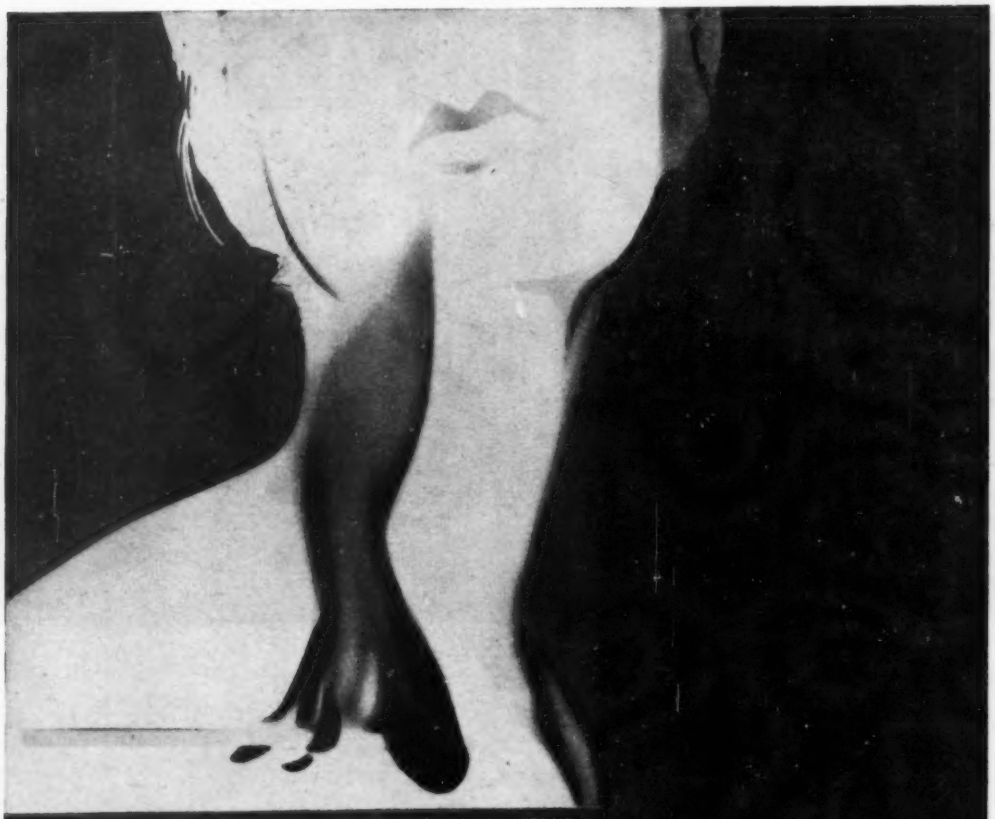


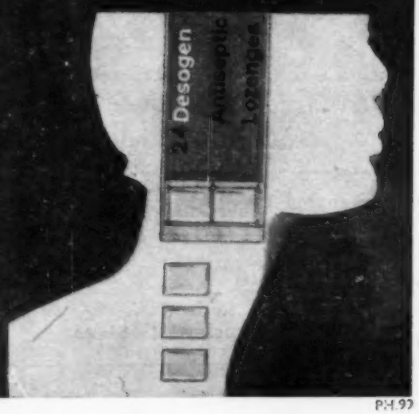
Desogen lozenges

Regd. Trade Mark

for the prevention and treatment of infections of the mouth and throat

Each Desogen lozenge contains 0.5 mg. of (dodecanoyl-N'-methyl-aminoethyl)-(phenyl-carbamyl-methyl)-dimethylammonium chloride.

In Containers of 24 tablets



Geigy

Geigy Pharmaceutical Company Ltd., Manchester 23

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NO LONG FACES WHEN CHILDREN TAKE . . .

Maw's

Tancolin

CHILDREN'S COUGH LINCTUS

Active Ingredients	%W/V
Theophylline ...	0.33
Ethylmorphine Hydrochloride	0.025
Sodium Antimonyl Tartrate	0.00125
Ascorbic Acid ...	0.25
Glycerin ...	20.8
Sodium Citrate ...	2.0
Citric Acid ...	1.0

Tangerine Flavoured to provide an immediately acceptable and effective treatment, appealing instantly to even the most unco-operative child patient. Tancolin combines a pleasant vehicle with a rational formulation — specifically for children.

TANCOLIN has been designed to give a twofold anti-spasmodic and sedative action. The inclusion of a demulcent, a reflex expectorant and added Vitamin 'C' content are valuable adjuncts to this primary function.

TANCOLIN is indicated for treatment of the distressing and irritating cough associated with the common cold, Bronchospasm Bronchitis and Inflammatory and Catarrhal affections of the Respiratory Tract.

TANCOLIN is freely prescribable on E.C.10 (Cat. 3/4) and achieves therapeutic efficiency with economy.

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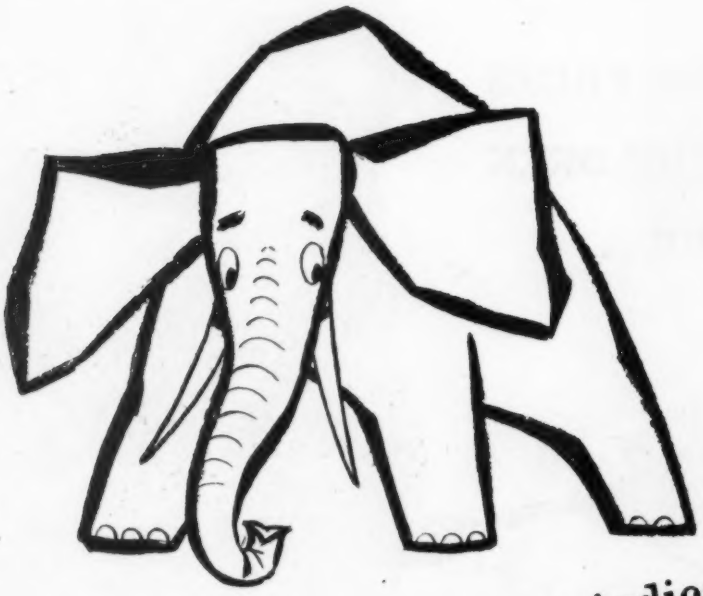

Where large doses are indicated . . .

Ce-K-Sal tablets contain soluble aspirin to provide rapid absorption without gastric irritation, with the protective Vitamin C for its detoxifying effect and value in febrile disease and Vitamin K for counteracting haemorrhagic tendencies induced by prolonged and intensive acetylsalicylic acid therapy.

FORMULA: *Each tablet contains soluble aspirin equivalent to acetylsalicylic acid 325 mg. (gr. 5), ascorbic acid (Vitamin C) 20 mg., acetomenaphthone (Vitamin K) 0.35 mg.*

Ce-K-Sal

SAFE SOLUBLE ASPIRIN

Literature and samples on request

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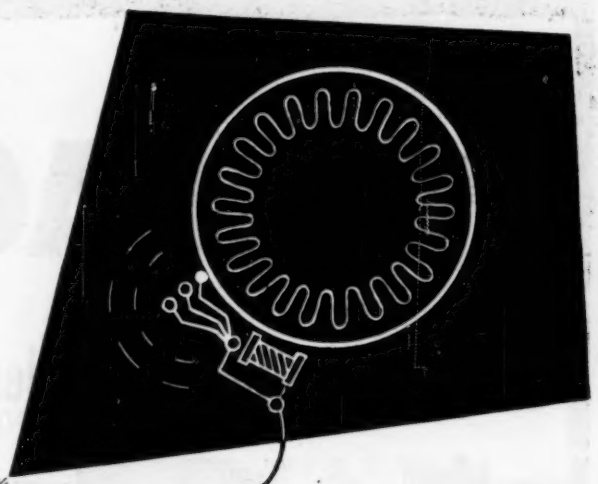
Dulcolax

Regd. Trade Mark

(4, 4'-diacetoxy-diphenyl)-(pyridyl-2)-methane

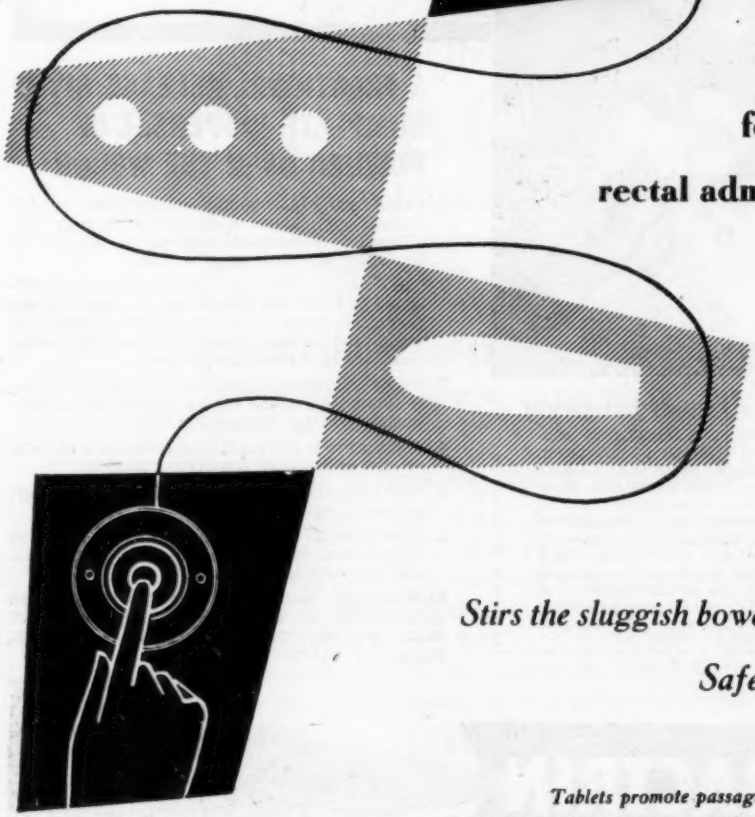
the modern

contact laxative



for oral and

rectal administration



Stirs the sluggish bowel into action.

Safe and reliable.

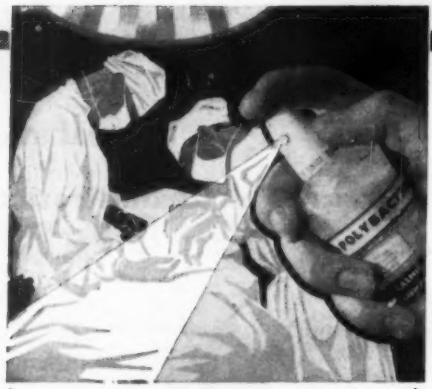
Tablets promote passage through the colon
Suppositories for prompt evacuation of the lower bowel

Dulcolax enteric coated tablets of 0.005 g. · Bottles of 30 and 200
Dulcolax suppositories of 0.01 g. · Boxes of 6 and 50

LEWIS LABORATORIES LTD., LEEDS 9

POLYBACTRIN

antibiotic powder spray



INVALUABLE IN ALL BRANCHES OF SURGERY

Polybactrin provides a unique and economical means of applying a combination of Zinc Bacitracin, Neomycin Sulphate and Polymixin 'B' Sulphate—the three antibiotics of choice for topical use. The antibiotics are presented in an ultra-fine powder form dispersed under pressure with a propellant, and unlike other means of powder insufflation in common use, there is no risk of contamination of the antibiotics by airborne pathogens obtaining entry into the unit by suction.

A FRACTIONAL RELEASE GIVES COMPLETE DISPERSAL OF POWDER OVER THE WOUND

1. The *Polybactrin* unit offers a new technique for topical application of antibiotic therapy, enabling an efficient, economical and dry coverage of the wound area to be made.
2. The extensive range of bactericidal activity afforded by the triad of bacitracin, neomycin and polymixin gives an extremely wide coverage of wound pathogens without the risk of inducing resistant strains of organisms.
3. Ps. pyocyaneus, particularly present in burns, is completely inhibited by polymixin, considerably reducing the healing time.
4. *Polybactrin* is not readily absorbed and there is no risk of systemic toxicity occurring.
5. The propellant gas is non-toxic and does not support combustion.
6. There are no contra-indications to the use of *Polybactrin*. Systemic therapy may be given concurrently if necessary.

FORMULA: Each pack contains: Neomycin Sulphate 750 mg. Polymixin 'B' Sulphate 150,000 units. Zinc Bacitracin 37,500 units. Propellent 83.5 g. Net contents 85 g.

POLYBACTRIN antibiotic powder spray

Supplies initially for Hospitals only—no samples available

CREWE: *Telephone: Crewe 3251-5*

CALMIC LIMITED

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AUSTRALIA: 458-468 Wattle Street, Ultimo. Sydney, N.S.W. **CANADA:** Terminal Building, York Street, Toronto

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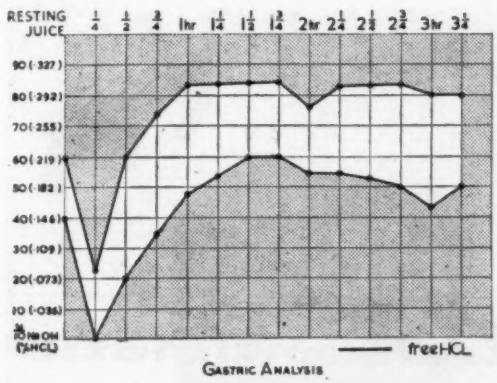
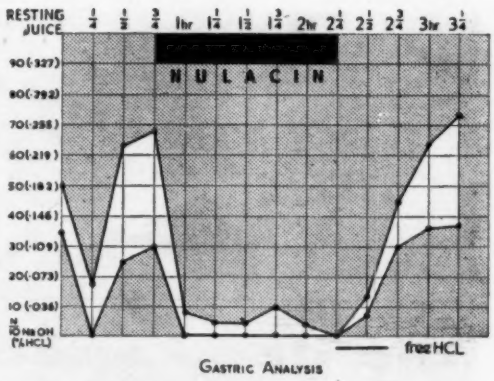


GASTRIC ANALYSIS



GASTRIC ANALYSIS

In the treatment of peptic ulcer— safe, simple, effective, without side effects

NULACIN

provides milk-alkali drip therapy

Almost effective control of gastric acidity is by milk-alkali drip therapy; the most convenient way of obtaining milk-alkali drip therapy is by sucking Nulacin tablets.

peptic ulcer in the ambulatory patient

Nulacin is of great value in the treatment of peptic ulcer in the ambulatory patient, and in the prevention of ulcer relapse.

clinical trials in three continents

Extensive clinical work has confirmed the claims made for Nulacin. References to some studies appear below. Other references will be given on request.

Nulacin tablets are not advertised to the public, have no B.P. equivalent and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of purchase tax. Basic price to N.H.S. is 2/-. Also available in tubes of 12.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and in many other countries. It is known as Nulactin in Canada and Sweden.

HORLICKS LIMITED

Pharmaceutical Division, Slough, Bucks.

SELECTED REFERENCES

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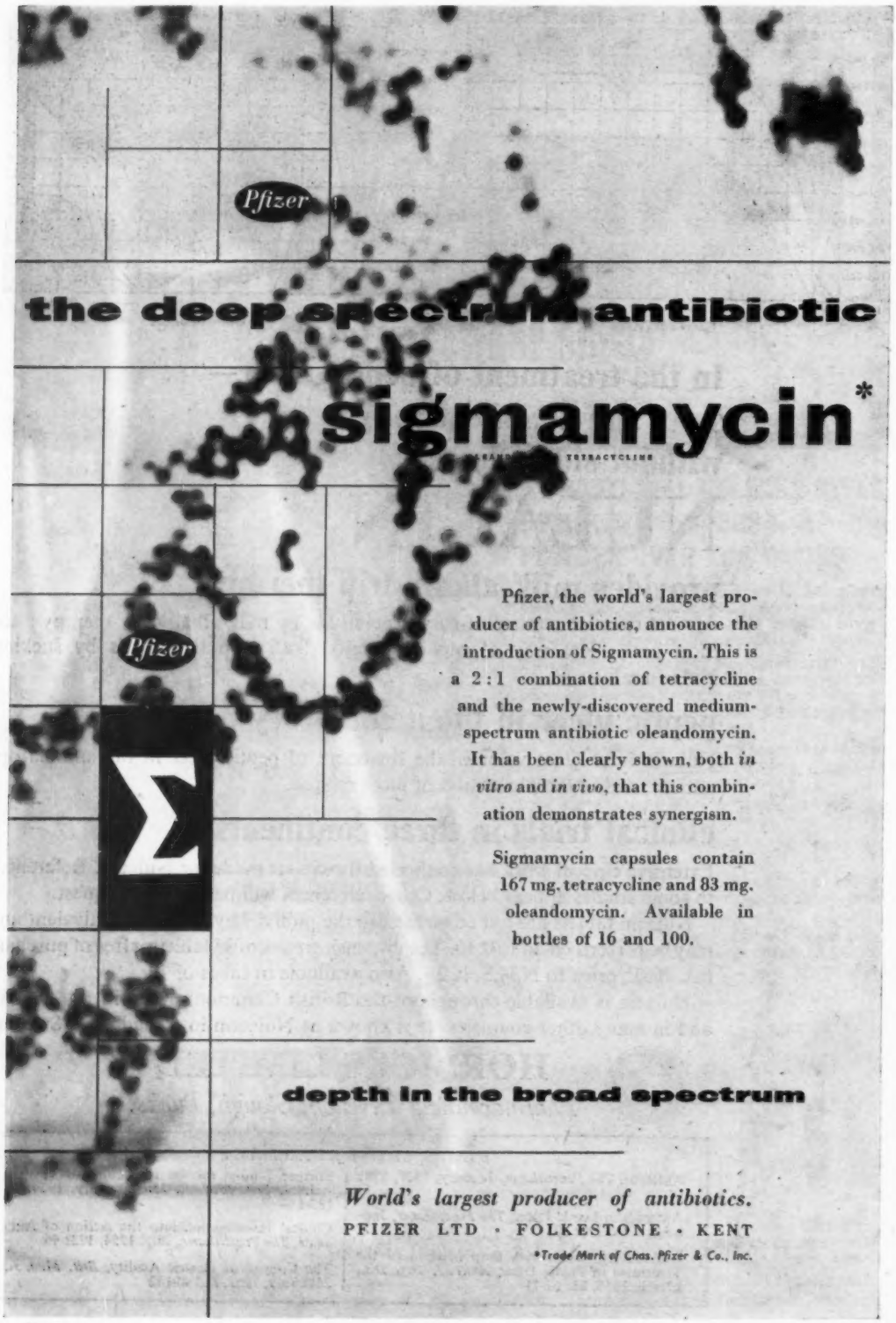

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Sigmamycin capsules contain 167 mg. tetracycline and 83 mg. oleandomycin. Available in bottles of 16 and 100.

World's largest producer of antibiotics.

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RAPID

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FOR ALL PAIN *that responds to aspirin; for all palates, and for all patients—even the dyspeptic* —PAYNOCIL *is universally acceptable.*

FOR CHILDREN *there is no pleasanter way of taking aspirin, and coaxing is seldom necessary.* JUNIOR PAYNOCIL *tablets contain just the right dose.*

NON-IRRITANT—the aspirin particles are minutely and evenly spread over the gastric mucosa in a harmless and non-adherent form.

ACCEPTABLE—the flavour of Paynocil is remarkably pleasant and the presence of aspirin is unnoticed.

QUICK DISPERSING—the disintegration of Paynocil tablets on the tongue—without water—has been called "flash dispersal". Chewing is unnecessary and swallowing effortless.

PAYNOCIL

EACH TABLET CONTAINS

Acetylsalicylic acid ..... 10 grains

Aminoacetic acid ..... 5 grains

PACKAGES in sealed foil strips:
Cartons of 18.
Dispensing packs of 240 : basic N.H.S. cost (tax free) 21/8d.

Junior PAYNOCIL

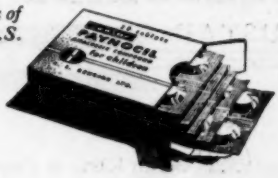
EACH TABLET CONTAINS

Acetylsalicylic acid ..... 2½ grains

Aminoacetic acid ..... 1½ grains

PACKAGES in sealed foil strips:
Cartons of 20.
Dispensing packs of 240 : basic N.H.S. cost (tax free) 12/-

PRICE NOW REDUCED



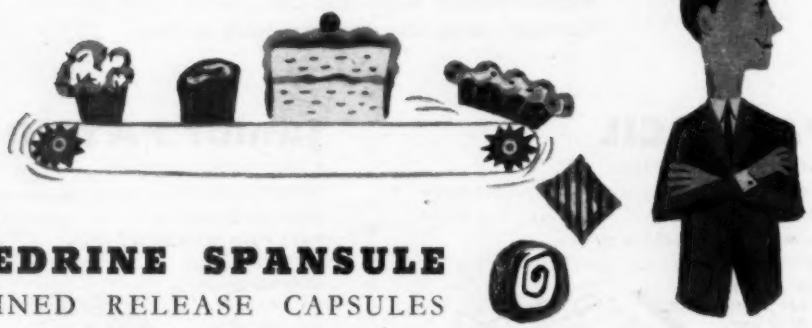
C. L. BENCARD LTD. PARK ROYAL, LONDON, N.W.10

what's the use of temptation

if you don't succumb to it?

For the between-meal nibbler every toothsome morsel is an irresistible temptation. 'Conveyor belt feeding' becomes a habit that punctuates his day with an endless series of 'little somethings'—most of them starchy and all of them fattening. With each surrender to temptation his girth grows greater and his will to resist is less.

'Dexedrine Spansule' capsules put temptation behind him by controlling his appetite all day long—*between meals as well as at mealtimes.* The single morning oral dose is easily remembered: between-meal snacks vanish as eating habits change, and *effective* weight reduction can begin.



DEXEDRINE SPANSULE

SUSTAINED RELEASE CAPSULES

control appetite in weight reduction

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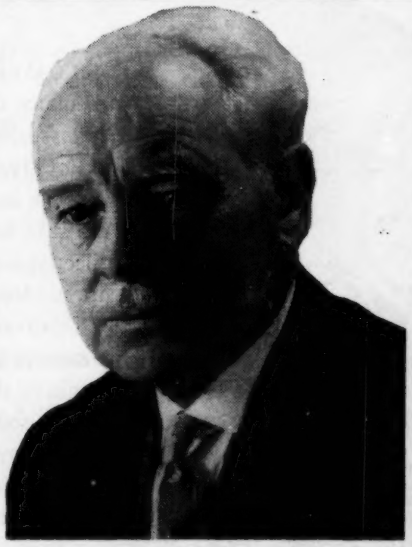
SUDP126

Facts his doctor wasn't told...

Retired for the last three years, the patient complains that he's unable to keep pace with his gentle present-day routine. 'Says he's always tired . . . can't understand it as he's always been so active for his age. He doesn't say however that since his wife died, he's lost interest in his food . . . his attention to diet has been lacking and regular meals have been replaced by casual snacks.

GEVRAL Geriatric Vitamin—Mineral Supplement was evolved to enable doctors to treat just such patients—to provide a balanced ration of essential nutrients in the simplest form. The usual dosage is one capsule daily—and the GEVRAL formula is so comprehensive that this routine provides effective all-round supplementation. Indeed, for many elderly patients the result is a gratifying return of general well-being—and the rediscovery that life *is* worth living!



GEVRAL*

Capsules

Geriatric Vitamin—Mineral Supplement

Each capsule contains:

Vitamin A	5,000 I.U.	Ascorbic Acid (C)	50 mg.
Vitamin D (viosterol)	500 I.U.	Purified intrinsic factor concentrate 0.5 mg.	
Vitamin B_{12} as present in concentrated extractives from streptomyces fermentation	1 microgram.	Rutin	25 mg.
		Iron (as $FeSO_4$)	10 mg.
		Iodine (as KI)	0.5 mg.
Thiamine mononitrate (B_1)	5 mg.	Calcium (as $CaHPO_4$)	145mg.
Riboflavine (B_2)	5 mg.	Phosphorus (as $CaHPO_4$)	110 mg.
Niacinamide	15 mg.	Boron ($as Na_2B_4O_7.10H_2O$)	0.1 mg.
Folic Acid	1 mg.	Copper (as CuO)	1 mg.
Pyridoxine HCl (B_6)	0.5 mg.	Fluorine (as CaF_2)	0.1mg.
Calcium pantothenate	5 mg.	Manganese (as MnO_2)	1 mg.
Choline dihydrogen citrate	100 mg.	Magnesium (as MgO)	1 mg.
Inositol	50 mg.	Potassium (as K_2SO_4)	5 mg.
Vitamin E	10 Units	Zinc (as ZnO)	0.5 mg.

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LEDERLE VITAMIN RANGE

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LEDERLE LABORATORIES DIVISION *Cyanamid* OF GREAT BRITAIN LTD. London, W.C.2 Lederle

The esters of NICOTINIC, SALICYLIC and p-AMINOBENZOIC acids bring relief to cases of arthritis and rheumatism

"Thank you, doctor"

IN CASES OF soft-tissue rheumatism, and arthritic disorders, many doctors are tending more and more to regard Transvasin as an indispensable adjuvant to treatment.

For Transvasin is composed of the esters of nicotinic, salicylic and p-aminobenzoic acids. These esters readily pass the skin barrier in therapeutic quantities, and so enable an effective concentration of drugs to be built up where they are needed.*

Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

*Therapeutische Umschau VIII, 1952, 10, 143.

Salicylic acid tetrahydrofurfuryl-ester...	14%
Nicotinic acid ethyl-ester.....	2%
Nicotinic acid n-hexyl-ester.....	2%
p-Aminobenzoic acid ethyl-ester.....	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes, basic N.H.S. price 2/6 plus P.T., and is not advertised to the public. Samples and literature will be gladly sent on application.

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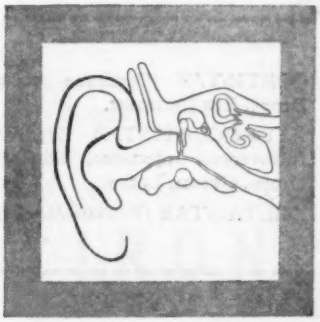
simpler, swifter, surer
treatment for ear infection

CHLOROMYCETIN* Ear Drops greatly reduce the time and effort necessary to treat suppurative otitis media, chronic otorrhoea, and infections of fenestration and mastoid operation cavities. Treatment can be conveniently carried out, if necessary in the patient's home, and is effective in a matter of days as compared with previous techniques requiring long and tedious application under close supervision.



CHLOROMYCETIN *Trade Mark

EAR DROPS 10%

(Chloromycetin 10% in propylene glycol) in 5 c.c. vials, with dropper, & bottles of 100 c.c.

Parke, Davis
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HOUNSLOW, MIDDLESEX
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NOW POSSIBLE!

INCREASED SAFETY AND EFFICIENCY WITH

HYDROMYCIN

IN THE TREATMENT OF INFLAMMATORY SKIN CONDITIONS

HYDROMYCIN by combining the anti-inflammatory properties of Hydrocortisone with the anti-bacterial properties of Neomycin offers increased safety over the use of Hydrocortisone alone. HYDROMYCIN is ideal in the treatment of contact dermatitis, atopic dermatitis and non-specific pruritus.

SKIN OINTMENT *Tubes of 5G and 15G*
EAR/EYE OINTMENT *Tubes of 3G*
EAR/EYE DROPS *Bottles of 3ml.*

THE FULL RANGE OF BOOTS BRITISH-MADE CORTICOSTEROIDS

CORTISTAB (Cortisone Acetate) Tablets, Injection, Eye Drops, Eye Ointment.
HYDROCORTISTAB (Hydrocortisone) Tablets, Local & Intravenous Injections, Skin Ointment, Eye Ointment, Eye Drops, Cream, Lotion.
DELTA-STAB (Prednisolone) Tablets.

BOOTS PURE

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COLLIRON

One of a complete range of

Iron Preparations

Many oral iron preparations cause gastro-intestinal irritation thereby making it impossible to administer sufficient iron by the oral route to restore the hæmoglobin level to normal. Colloidal ferric hydroxide in the form of COLLIRON overcomes this great disadvantage, as the iron is presented in a non-irritant form and is readily tolerated even in large dosage over a prolonged period.

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2. *Well tolerated*
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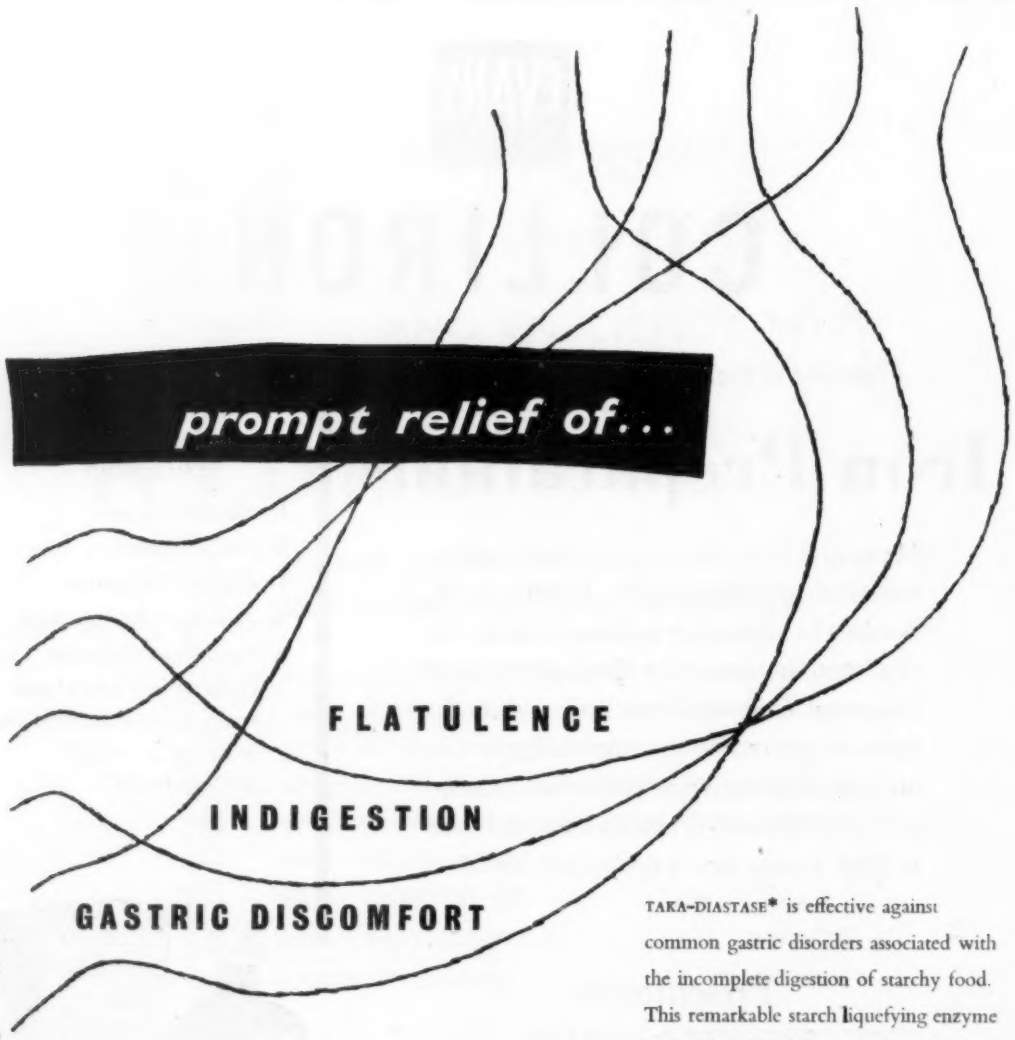

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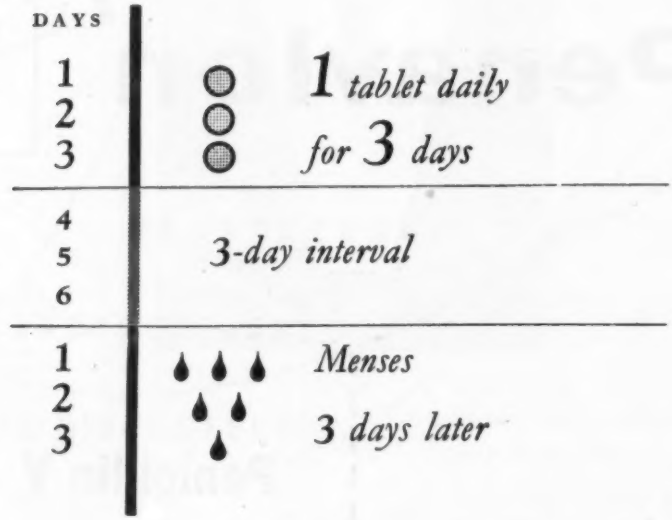

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THE NATURAL HISTORY OF ULCERATIVE COLITIS*

E. R. CULLINAN
M.D. Lond., F.R.C.P.
PHYSICIAN TO ST. BARTHOLOMEW'S AND WESTMINSTER (GORDON) HOSPITALS

I. P. MACDOUGALL
M.D. Lond., M.R.C.P.
CONSULTANT PHYSICIAN TO THE HERTFORD GROUP OF HOSPITALS; MEDICAL CHIEF ASSISTANT, THE GORDON HOSPITAL

KNOWLEDGE of the natural history of ulcerative colitis is necessary in assessing prognosis. It is also important in deciding whether the treatment of a particular patient should be medical or surgical. The majority of patients suffering from ulcerative colitis run an unpredictable course, and in these the decision whether to advise removal of the colon is often very difficult. It was thought that some help might be gained by reviewing very briefly our personal experience of a large number of patients in one hospital.

The natural history of the following series of patients illustrates the difficulty of forecasting the outcome, in most patients, from the previous course of the disease. It also shows that those with a poor outcome did have certain common features which may assist in achieving earlier an accurate prognosis in future patients.

The prevalence of ulcerative colitis in the population is difficult to estimate. In 1946 one of us (E. R. C.) admitted to hospital every patient who came complaining of chronic diarrhœa. Of 99 consecutive cases, 41 were found to be of ulcerative colitis (Cullinan 1949).

Material

The material consists of 346 patients about whom we have up-to-date information who first attended the Gordon Hospital, London, between July 1, 1947, and June 30, 1955—i.e., exactly eight years. The series includes both "medical" and "surgical" cases. 170 of the patients were under the personal care of one of us (E. R. C.); the remainder were under the care of our surgical colleagues, and the majority were seen by one or both of us. The figures are derived from a continuous follow-up which is being carried out by one of us (I. P. M.).

The few cases of regional and segmental colitis and those whose diagnosis was in doubt have been deliberately omitted. The cases have been divided into three arbitrary groups according to the extent of colon involved.

Group A (diffuse).—Those with evidence of involvement of the entire colon.

Group B (distal).—Those with evidence of involvement of part of the colon continuous distally to the rectum.

Group C.—Those with sigmoidoscopic evidence of ulcerative colitis but negative X-ray findings.

The division was made because, as will be shown, the severity and gravity of the disease differs markedly in the three groups. Our justification for regarding these three groups as different degrees of the same disease-process is that the sigmoidoscopic appearances were the same in all and the histological findings in rectal biopsies were identical (Lumb and Protheroe 1955). For example, in group C the 68 patients all underwent sigmoidoscopy. 26 were selected at random for biopsy and 21 of these had histological findings indistinguishable from those of the patients in the other groups. This does not prove the point, but the argument is reinforced by a further fact. Besides the 68 patients who were "X-ray negative" at the last examination, 20 who were in this category when first seen later became "X-ray positive," 11 finally having the entire colon affected.

We have seen 12 patients first recognised as being in group B (with the so-called "distal" colitis) later develop "diffuse" colitis (group A). It should be remarked that these changes were independent of the duration of the disease.

TABLE I—DISTRIBUTION ACCORDING TO SEX AND EXTENT OF DISEASED COLON AT THE LAST EXAMINATION

—	Group		
	A	B	C
Male	53	57	24
Female	80	88	44
Total ..	133 (*38%*)	145 (*42%*)	68 (*20%*)

Table I shows the number of patients in each group at the time of the last examination.

Table II shows the age at onset of symptoms, which ranged from 4 to 90. The great majority began between the ages of 20 and 50. In all groups women preponderate over men in the ratio of 60 : 40. There was no significant difference in the age at onset in the three groups.

History

Previous History

The former health of the patients had been good. There was no previous history of colonic disorders such as the syndrome of "irritable colon." Only 3 patients had a family history of the disease.

TABLE II—AGE AT ONSET OF SYMPTOMS

Age		0–9	10–19	20–29	30–39	40–49	50–59	60–69	70–79	80–89	90	Total
No. in all three groups	Male	2	12	33	30	36	12	4	4	0	1	134(*39%*)
	Female	3	21	63	54	34	18	16	2	1	0	212(*61%*)
	Total	5	33	96	84	70	30	20	6	1	1	346

Onset

The onset of symptoms was more often abrupt than gradual. In each group the initial degree of illness was seldom severe, although early deterioration in some of the patients was rapid.

Cause of the onset.—We do not intend to discuss ætiological factors in ulcerative colitis, but must mention two. We were again impressed by the importance of psychogenic factors in the ætiology, though their mechanism remains obscure. Their recognition, although not calling for specialised psychotherapy, is most important for successful treatment.

Another factor which demands explanation is the effect of pregnancy. One of us (I. P. M.) found that of the 100 women in this series who had been pregnant, a quarter ascribed the onset of the disease to pregnancy or the puerperium (MacDougall 1956).

Subsequent Course of the Disease

Those patients whose course was predictable from the onset were few. Only 2 ran so violently acute and fulminant a course (with profuse and severe diarrhœa and the passage of blood, pus, and mucus, accompanied by grave constitutional illness starting within a few hours or days of the onset) that they would almost certainly die within days or weeks (usually of general peritonitis following perforation). Only 27 had unremitting severe symptoms, and only 11 were predictable in the sense

* Read at the International Congress of Gastroenterology (5th meeting of l'Association des Societés Européennes et Méditeranéennes de Gastroenterologie) held in London, July, 1956.

TABLE III—DURATION OF SYMPTOMS TO DATE, TO OPERATION, OR TO DEATH (ALL 3 GROUPS)

Duration (yr.)	<1	0–5	6–10	11–15	16–20	21–25	26–30	31–35	36–40	>40
No. of patients	18	99	120	62	34	15	9	2	3	2

that they had annual or biannual relapses with persistent regularity. The remaining 306 cases ran an unpredictable chronic course, often lasting for many years, marked by remission and relapse.

Table III shows the duration of the disease to date, to operation, or to death. It will be seen that about 70% of the cases have already lasted for over five years and that some have lasted for over thirty years.

The mode and severity of the onset bore little relation to the subsequent behaviour of the illness and the most banal beginnings sometimes had very serious later developments. In most cases the lengths of remissions and the severity of relapses were unpredictable. We have carefully compared the course of the disease before the patient first attended for treatment with its subsequent behaviour and have found so little correlation that this is seldom of value.

Mortality

The gravity of the attack and of the relapses, however, is very different in the three groups. The greatest danger to life and the greatest severity of symptoms is, as would be expected, in group A where the entire colon is affected. The danger to life in the three groups is shown in table IV.

TABLE IV—MORTALITY (INCLUDING PATIENTS OPERATED ON) RELATED TO EXTENT OF COLON INVOLVED

—	Group			All groups
	A	B	C	
No. of patients ..	133	145	68	346
No. dead	20	8	0	28
Percentage dead ..	15	5·5	0	8

The disease in groups A and B was roughly comparable in duration, but it will be seen that there were three times more deaths in group A than in group B. In group C the illness is non-fatal. 31 patients in group A showed involvement of the terminal ileum. The mortality was the same in these as in the remainder of the group.

Severity

The severity of symptoms of the initial attack and of relapses is directly related to the extent of colon involved.

In group A (the diffuse type) the patient may gradually or suddenly become extremely ill. There may be high fever, profound exhaustion, dehydration, toxicity, and extreme emaciation. Severe diarrhœa is the rule.

In group B (the distal type) the initial active phase and the relapses are usually associated with far less general upset and are characterised more by bleeding and anæmia. There may be either diarrhœa or constipation.

In group C, bleeding is usually the only symptom. Occasionally there is a little mild fever. The patients are often constipated, though sometimes the stools are loose.

These differences of severity are illustrated in table V, which shows the course of the disease after the attack which first brought the patient to the Gordon Hospital.

It will be seen that over half the patients in group A suffered severe or very severe symptoms, that over half in group B were in virtually normal health, and that in group C there were no severe symptoms at all.

Other Criteria

The extent of colonic involvement is a useful guide to the probable outcome, but the intensity, severity, and duration of the attacks is almost as important as the extent of bowel involved. Toxæmia, malnutrition, dehydration, leucocytosis, anæmia, and certain systemic complications are indications of severe and potentially lethal disease.

"Systemic complications" included malnutrition, hypoproteinæmia, oral ulceration, glossitis and cheilosis, erythema nodosum and pyoderma, polyarthritis, thrombophlebitis, iridocyclitis threatening blindness, and peripheral neuritis.

An analysis of the whole group, after excluding the 68 cases in group C, in which there have been no deaths, revealed that the majority of the severely ill and fatal cases showed two or more of the following three features: leucocytosis of 10,000 or more cells per c.mm.; (2) hæmoglobin below 70%; and (3) one or more "systemic complications."

This "toxic triad," as one of us (I. P. M.) has named it, is far less commonly seen in group B than in group A; 28% of patients in group A had 2 of the features and only 4% in group B. But it is interesting to observe, in retrospect, the striking difference in mortality between patients with none or one and patients with *two* of the three elements of this triad, the latter being nearly nine times the former (table VI). This cannot, of course, be used as a rule of thumb, but it does show that signs of severe toxicity are of equal importance whether part or all the colon is diseased.

Local Complications

Many of the patients had local complications in the bowel but these were not connected with fatality to the same degree as the systemic complications. They included severe hæmorrhage, perirectal and pericolic lesions, strictures, and pseudopolyposis, and often required operative treatment. In parenthesis, it is interesting that in two patients who had developed recto-vaginal fistulæ, the fistulæ healed spontaneously without operation. 6 patients in the series developed malignant degeneration. They were all patients in group A who had had the disease for a long time—2 for eight years and the others for thirteen, nineteen, twenty-five, and twenty-six years. The patient who had had symptoms for thirteen years was interesting: the carcinoma developed in a functionless colon, an ileostomy having been done three years before.

Treatment

Influence of Medical Treatment

We shall not discuss the treatment of ulcerative colitis but wish to make three comments.

TABLE V—SYMPTOMS AFTER TREATMENT

Symptoms *	Patients with symptoms (% of group)		
	Group		
	A	B	C
None	11	20	24
Trivial	8	34	48
Moderate	11	17	13
Severe	22	9	0
Very severe	35	9	0
Insufficient information ..	13	11	15

* Explanation of severity of symptoms:

None: No symptoms since recovery from attack which brought patient to Gordon Hospital.

Trivial: Occasional loose stools or rectal bleeding, with long remissions. Work and recreation not interfered with.

Moderate: Diarrhœa in attacks (bowel actions 3–8 times daily, often with blood). Hospital admission sometimes required. Disease is a handicap, interfering with but not usually preventing work or recreation. Often long remissions.

Severe: Continuous diarrhœa (bowels opened 3–8 times daily often with blood), or attacks of greater severity but with periods of remission. Many of these patients have been operated on.

Very severe: Fulminating or relentless disease, usually fatal if operation withheld.

TABLE VI—MORTALITY-RATE RELATED TO THE "TOXIC TRIAD" (ANÆMIA, LEUCOCYTOSIS, SYSTEMIC COMPLICATIONS)

—	Group A	Group B	Total
Patients with two features ..	36%	33%	35%
Patients with one feature or none	7%	3·6%	4·2%

The first is that four cardinal needs are vital to success in the general medical treatment of ulcerative colitis and may be summarised as follows: meticulous and patient nursing; unremitting care in alleviating symptoms as they arise; detailed attention to nutrition, fluid and electrolyte balance, and the like: and courage, patience, encouragement, and quiet confidence and faith of physician and nurse which transmit themselves to the sufferer. It is difficult to overemphasise these needs. Lack of attention, and gloom and despair, can kill.

We have had little success with chemotherapeutic and antibiotic agents. We have found neomycin useful in sterilising the stool as a preoperative precaution, for helping an open lesion in the rectum or anus to heal, and in the violently acute fulminating cases where perforation threatens. Otherwise we have found them of little or no value in treatment.

Only certain patients responded satisfactorily to corticotrophin (A.C.T.H.) or cortisone—usually those who were having a severe acute attack, particularly in the earlier stages of the disease. When they were effective, the results were striking, and sometimes led to a complete remission. These effects were of great value as a prelude to surgical operation in critically ill patients.

Surgical Treatment

Sometimes the decision to advise operation is easy. Certain complications threatening early death or grave disability are clear indications for surgery. Again, when the course of the disease is severe and predictable, as in the acute fulminating type, or when there are long-continued, unremitting, severe symptoms with relentless deterioration of the patient, in spite of efficient medical treatment, it would be folly to withhold colectomy.

The majority of cases of ulcerative colitis, however, pursue an irregular and largely unpredictable course, and it is important to decide which of these patients should be advised to have surgical treatment. There is little doubt that some patients die for want of a timely operation, but the opposite extreme of removing the colon in every case would be an absurd policy. The decision as to which cases should be selected for surgery grows in importance as the operation for removal of the diseased colon becomes safer; but it is still not to be undertaken lightly. However lyrical one becomes, there is nothing poetic about an ileostomy. The development of operations to restore the continuity of the bowel after resection of the colon, though very encouraging, is still in its early days. Each individual case has to be judged on its own merits, but the paragraphs which follow crystallise our present general view, supported, we think, by the figures we have shown.

The clinical course in X-ray negative cases (group C) is mild so long as there is no proximal spread.

The outlook in the majority of cases of the distal type of X-ray-positive cases (group B) is usually relatively benign, and such patients are not likely to require surgery except for the relief of certain local complications. We are satisfied that most of these patients have less disability than they would after surgery. This enables one to plan for the majority a conservative course and to give a reassuring prognosis. We have already shown that half of them are, for all practical purposes, in normal health.

If the whole colon is affected (group A) the disease commonly causes death or invalidism, and operation is much more likely to be needed, although a surprising number of such patients do well with medical management.

It is our opinion that all patients with evidence of severe toxicity, as previously defined, have a potentially lethal disease and should have their colons removed. Furthermore, if the long-term effects of operations to restore continuity of the bowel after resection of the colon prove satisfactory, we think we should probably advise all patients who have the diffuse type of ulcerative colitis (group A), and do not quickly improve with medical management, to have a colectomy; and this would be our advice until the day when this strange disorder can be cured by medical means alone.

One of us (I. P. M.) receives a grant from the Gordon Hospital (Westminster Hospital's teaching group) Research Fund. We are grateful to our surgical colleagues at the Gordon Hospital for allowing us unrestricted access to their patients, and to Miss H. M. Davies, the research secretary, for her help.

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ADRENALECTOMY AND HYPOPHYSECTOMY FOR ADVANCED CANCER OF THE BREAST

A COMPARATIVE STUDY

H. J. B. ATKINS
D.M., M.Ch. Oxfd, F.R.C.S.
DIRECTOR OF THE DEPARTMENT OF SURGERY, GUY'S HOSPITAL

M. A. FALCONER
M.Ch. N.Z., F.R.C.S., F.R.A.C.S.
DIRECTOR OF THE GUY'S-MAUDSLEY NEUROSURGICAL UNIT

J. L. HAYWARD
M.B. Lond., F.R.C.S.
ASSISTANT TO THE DIRECTOR OF THE DEPARTMENT OF SURGERY, GUY'S HOSPITAL

K. S. MACLEAN
M.D. Camb., F.R.C.P.
ASSISTANT DIRECTOR OF THE DEPARTMENT OF MEDICINE, GUY'S HOSPITAL

THE treatment of advanced mammary cancer by modifying the endocrine environment may be said to have started in 1896, when Beatson removed the ovaries of two patients with widespread metastases and produced remissions. Lett reported a further series at a meeting of the Royal Medical and Chirurgical Society in 1905, and for many years subsequently oöphorectomy was practised sporadically, resulting in temporary improvement in about a third of the patients.

Evidence that ovarian hormones are concerned in the production of carcinoma of the breast has since been provided by experiments on animals, notably those of Lacassagne (1932), who induced malignant changes in the breasts of male mice by injecting large amounts of œstrone benzoate. Furthermore in recent years several instances have been recorded of carcinoma of the breast developing in male patients who had received large doses of œstrogens for prostatic carcinoma (Graves and Harris 1952).

While oöphorectomy represented an advance in the treatment of widespread breast cancer, the results obtained posed new problems, because only a minority of patients responded and even in the successful cases the benefit was temporary. An explanation appeared to lie in the secretion of œstrogens by adrenal tissue, which

would be unaffected by the removal of the ovaries. In 1945 Huggins performed adrenalectomy on patients with advanced disease, but they all afterwards died of adrenal failure, and the results were not reported until later (Huggins and Dao 1953).

Independently in this country, the first adrenalectomy for breast cancer was performed in November, 1947, by one of us (H. J. B. A.) at Guy's Hospital. The object was to remove as much as possible of œstrogen-secreting tissue; but, as cortisone was not available at that time, it was not possible to perform total adrenalectomy. Both ovaries and about three-quarters of the left adrenal gland were removed at the first stage, and the whole right adrenal gland at the second stage. Seven such cases of advanced breast cancer were operated on in this way, 'Eschatin,' 'Eucortone,' and deoxycortone acetate being used as supportive therapy for about 5 days after the second operation until the surviving fragment of the left adrenal resumed its function. There was one postoperative death, and two cases showed slight remission. These cases, also, were not reported, because it was thought that, if enough adrenal tissue were removed to affect the cancer significantly, the hazard to life would be too great; and the method was allowed to lapse.

With the advent of cortisone, however, total adrenalectomy became a practical proposition, and, following the lead of Huggins, a fresh start was made at Guy's Hospital. By November, 1953, when hypophysectomy was introduced as an alternative method of treatment, eighteen cases of advanced breast cancer had been subjected to oöphorectomy and total adrenalectomy in two stages, and this had become a standard procedure for patients with inoperable growths who were unsuitable for radiotherapy and had not responded to hormones.

Although total adrenalectomy with oöphorectomy proved more effective than oöphorectomy alone, there was the same inconsistency in the results. On the assumption that the failures and relapses might be due either to aberrant adrenal tissue, which could be controlled by removal of the pituitary gland, or possibly to a carcinotrophic substance secreted by the pituitary itself, hypophysectomy became the next logical step. Encouraging results were reported by Luft and Olivecrona (1953), and the first hypophysectomy for breast cancer was done at Guy's Hospital in November, 1953, by one of us (M. A. F.).

From the first reports it was obvious that hypophysectomy was not going to provide the final answer to metastasising carcinoma of the breast. Many patients still did not respond, and others relapsed after initial improvement. The question whether hypophysectomy offered any clear advantage over total adrenalectomy with oöphorectomy was obviously therefore of great importance, and it is with this question that the present investigation was concerned.

Selection of Cases

During the past 3 years adrenalectomy or hypophysectomy has been considered for all patients with advanced cancer of the breast for whom the possibilities of direct surgery, irradiation, and hormone therapy have been exhausted. Cases in this category were to be discarded only if they were regarded as quite unsuitable for any operation, the patients being moribund. Only one case has, in the event, been discarded on such grounds—because of multiple secondary deposits in both lungs and extreme dyspnœa at rest. In another case, which was selected for hypophysectomy, the patient died of the disease before the operation could be undertaken.

A few patients have been left out of the series because they or their doctors specified which of the two operations should be performed. In the remainder, comprising the sixty here reviewed, the type of operation was decided by a method of random selection which is accepted as precluding bias towards one operation or the other (Atkins 1956).

Technique of Adrenalectomy

Preoperative

The patient is admitted to hospital 3 days before operation, so that a final check can be made on the stage which the disease has reached. Visible or palpable lumps are again measured, and fresh X-ray photographs are taken of bone or chest lesions. Hæmoglobin is estimated, and samples of urine are taken for analysis of the 17-ketosteroids (see accompanying paper Allen et al. (1957)).

Cortisone is given in preparation for the first stage, because, if one adrenal has been destroyed by growth, removal of the other will deprive the patient of all her adrenal tissue.

Since preoperative preparation with cortisone has been used, the support of the blood-pressure both during and after operation has presented few problems. In the early cases an intravenous drip of $\frac{N}{5}$ saline-solution and 4% dextrose was maintained at both stages of the operation and during the immediate postoperative periods in case supporting fluids should be needed urgently, but in the later cases a drip has been set up only for the second stage. Blood has been given when there was an associated anæmia. Any fall in blood-pressure during operation has been readily combated by a head-down tilt, or very occasionally by intravenous methylamphetamine ('Methedrine'). A noradrenaline drip has never been required.

As control of the blood-pressure has been so successful, anæsthesia has presented few problems unless there was some associated disease. A non-explosive anæsthetic must be used, in view of the need for diathermy and the proximity of the pleura. Because of the position required for operation, controlled respiration has been found necessary both to provide a quiet operation field and to combat the reduction in tidal excursion. The standard thiopentone induction, followed by endotracheal nitrous oxide and oxygen and supported by intravenous tubocurarine and pethidine has proved ideal for this purpose. In positioning the patient, great care has to be taken to avoid pathological fracture of the ribs or vertebræ.

Operative

The original two-stage procedure through the flank has been persisted with because we decided not to modify our procedure while it was under investigation. But it also has certain inherent advantages. It is, on the whole, safer than the method of removing both adrenal glands at the same sitting, and it has the advantage, over the abdominal approach, that enlargement of the liver by secondaries does not gravely impede the operation on the right side, and a good exposure is always possible, enabling accessory adrenal tissue in the vicinity to be found and removed.

At the first stage the abdomen is explored and oöphorectomy performed. This is done whether or not the ovaries have been allegedly destroyed by X rays or by previous surgery. The patient is then turned on to the left side and, after removal of the twelfth or the eleventh rib, whichever is the more prominent, the right adrenal is removed through the flank. 10 days later the left adrenal is removed by the corresponding route.

Postoperative Management

For all practical purposes the postoperative régime after the first adrenalectomy is the same as after the second. There is always the possibility that, at the first operation, the only functional adrenal gland has been removed; and therefore full cortisone cover may have to be provided. Table I gives the basic plan of administering cortisone, deoxycortone, salt, and antibiotics throughout both operations. Although this plan has been adhered to in most cases, it is only a general guide.

We provide penicillin and streptomycin cover during both operations. This is necessary for three reasons: (1) owing to a low blood-pressure the patient may have to be kept flat in bed for longer than usual, thereby increasing the likelihood of chest infection; (2) many patients have chest secondaries and therefore have little respiratory reserve if they contract a slight infection; and (3) cortisone favours the development of infection in the chest or the wound.

Morphine is not given as a postoperative analgesic, because the presence of secondaries in the liver would delay its breakdown. Pethidine 50–100 mg. is used instead.

Except in the immediate postoperative period the nursing care is the same as that after any major operation. Owing to

TABLE I—ADRENALECTOMY: PREOPERATIVE AND POSTOPERATIVE RÉGIMES

Day	Cortisone	Deoxycortone acetate	Sodium chloride	Antibiotics
Preoperative 1, 2	50 mg., I.M. b.d.			B.d.
1st stage (op. 2 P.M.) ..	100 mg. I.M. 6 A.M., and on return from theatre			,,
Postoperative 1, 2	50 mg. I.M. 6-hrly			,,
,, 3, 4	50 mg. orally b.d.			,,
,, 5, 6, 7 ..	,, ,, ,,			—
,, 8	,, ,, ,,			B.d.
,, 9 (preop. 1) ..	50 mg. I.M. 12 A.M., 6 P.M., and 12 P.M.			,,
2nd stage (op. 2 P.M.) ..	100 mg. I.M. 6 A.M. and on return from theatre	5 mg. I.M. 6 A.M.	5 g. orally 6 A.M.	,,
Postoperative 1, 2	50 mg. I.M. 6-hrly	5 mg. I.M.	Saline solution I.V.	B.d. for 4 days
,, 3, 4, 5 ..	50 mg. orally b.d.	,, ,,	5 g. orally decreasing by 1 g. a day	
,, 6, 7	25 mg. orally t.d.s.	,, ,,	,,	
,, 8, 9	25 mg. orally b.d.	,, ,,	In food	
,, 10	,, ,, ,,	300 mg. implant and 5 mg. I.M.	,,	
,, 11–14 ..	,, ,, ,,	Decrease I.M. dosage by 1 mg. daily	,,	
,, 15 onwards ..	,, ,, ,,		,,	

the poor general condition of many of these patients wounds tend to heal slowly. Accordingly, stitches are left in longer than usual, especially the continuous skin suture in the loin incision at the first stage. (This is left in during the second operation because of the risk of the wound's breaking down while the patient is being turned on the table.)

Postoperative Complications

The abdominal incision broke down in one case, on the 8th postoperative day. The first-stage loin incision also broke down in a further case, on the 1st day after the second stage. Both healed well on further suture. There was one case of wound infection, which cleared under antibiotic therapy, and there were three cases of urinary infection. Two of these responded quickly to treatment, but in the third the infection persisted until the patient died, when it was found at necropsy to be due to growth in the bladder wall. There was one severe postoperative chest complication—a massive collapse of the left lung which precipitated the patient's death. Apart from this there were several minor chest complications, but these resolved quickly under treatment. There have been no cases of deep-vein thrombosis and no pulmonary emboli.

Technique of Hypophysectomy

Preoperative

Patients are usually admitted to hospital 7–10 days before the operation. The first 2–4 days are occupied in assessing the stage of the disease and in obtaining such data as the urinary excretion of 17-ketosteroids and the uptake of radioactive iodine by the thyroid gland, as a base-line for subsequent determination of residual pituitary function. For 6 days before the operation cortisone is given: at first the dosage is 50 mg. daily by mouth, but during the last 2 or 3 days it is increased, reaching 400 mg. (in divided doses) on the day of operation, half by mouth and half intramuscularly. During this long period of preoperative preparation the opportunity is also taken to aspirate massive pleural effusions or ascites so as to lessen dyspnœa and facilitate anæsthesia.

Operative

The operations are done under intratracheal anæsthesia (nitrous oxide, oxygen, and ether, or intravenous pethidine). A small right frontal craniotomy is performed with the patient in a slight reversed Trendelenburg position. This differs only in details from that described by Olivecrona (Luft and Olivecrona 1953) and by Bronson Ray (Pearson et al. 1956). The anterior limb of the bone-flap is cut obliquely above the frontal air sinus so that its outer angle lies immediately above the external angular process of the frontal bone and so level with the floor of the anterior cranial fossa. From this direction (which makes an angle of 20–30° with the sagittal plane) the right frontal lobe is lifted off the anterior cranial fossa, and the chiasmal region is approached. Ready access to this region is always obtained by sucking cerebrospinal fluid (C.S.F.) from the cisterna chiasmaticus, and in no instance has preliminary drainage of C.S.F., either by the lumbar or the ventricular route, proved necessary. The two optic nerves and the chiasma are then uncovered by incising the arachnoidal wall of the cisterna chiasmaticus. Finally any remaining arachnoidal tissue in the concavity of the chiasma is divided, revealing the infundibulum (pituitary stalk) and the diaphragma sellæ.

The pituitary stalk is then clipped low down with a silver clip and divided below this, flush with the diaphragma. Next, the diaphragma is incised in a Y-shaped or X-shaped manner up to the line of the circular sinus, revealing the yellow pituitary gland. The gland itself is teased out of its fossa with a small dissector, sometimes in one piece but usually in fragments. Slight to moderate venous bleeding from the walls of the pituitary fossa often takes place during this stage but usually ceases after the bulk of the gland has been removed. The removal of the gland is completed by scraping the walls of its fossa with curettes and by inserting appropriately angled suction tubes. The most elusive portion of the gland is that tucked beneath the right optic nerve.

The pituitary fossa then appears as a small cavity lined by smooth red fibrous tissue. A pledget of cotton-wool steeped in Zenker's fluid has been inserted into the fossa of all but 7 of the 30 patients for 2 or 3 minutes to necrose any tiny fragments of pituitary tissue which might have escaped removal. Precautions are taken during this manœuvre to prevent spilling of the fixative outside the pituitary fossa, and at its completion the walls of the fossa always appear grey. Finally, in all but two cases, before the craniotomy is closed, a plug of "cold-curing" acrylic paste was placed in the pituitary fossa and allowed to set into a hard plate to prevent any possible regeneration of the pituitary stalk into the pituitary fossa.

Usually the operation progresses readily step by step, but in a few cases certain difficulties are encountered. In seven cases the chiasma was prefixed—i.e., less than 5 mm. from the tuberculum sellæ—leaving little room for inserting the instruments. This difficulty, however, was overcome, as a rule, by chiselling away the hinder 3–4 mm. of the tuberculum. In no case did section of the chiasma or of one optic nerve prove necessary for the exposure. In one case of prefixed chiasma, however, the diaphragma sellæ was evidently tilted downwards and backwards away from the line of vision; the operation consequently was abandoned, and the case counted as a failure for hypophysectomy. In most cases a pint of blood was transfused during the operation, and in no case were hypotensive arterial techniques or hypothermia employed.

Postoperative

In general, the postoperative management causes no more concern than that after an operation for pituitary tumour. Recovery of consciousness is prompt, and the patient is usually drinking and eating again within a few hours.

Cortisone to a total of 350 mg. is usually given on the day following operation, partly by mouth and partly intramuscularly; this is decreased in stages to an oral dose of 25 mg. twice daily by the 8th day, at which level it is subsequently maintained. The scalp stitches are usually all removed by the 4th day, and, if the carcinomatous condition allows, the patient got out of bed between the 5th and 8th postoperative days.

Long-term Treatment

Patients who have been subjected to adrenalectomy or hypophysectomy are exposed to certain hazards for the rest

of their lives. If these dangers are to be minimised, it is essential that maintenance therapy should be most carefully supervised, and that the closest coöperation should exist between the hospital and the general practitioner. It is our practice to see each patient as an outpatient at 4-week intervals, and doctors are asked to communicate with the hospital immediately if any untoward symptoms develop in any of these cases between visits.

At each attendance at hospital, the condition of any neoplastic lesion is assessed and the patient's weight and blood-pressure are recorded. Special inquiry is made about lassitude, anorexia, nausea, vomiting, or anything that might suggest infection.

In hypophysectomy cases the serum-cholesterol level is estimated from time to time to assess thyroid function. Electrolyte studies have been carried out in all patients in whom there was reason to suspect incipient adrenal deficiency clinically. The importance of rising serum-potassium and blood-urea levels has been emphasised in this connection.

Though hypophysectomised patients require certain additional therapeutic measures (see below), the maintenance treatment of all the patients was made as similar as possible.

Cortisone

The standard dosage is 25 mg. twice daily by mouth. This probably represents an increase of about 50% above the glucocorticoid production of a normal person, but it provides an added safeguard against minor stress and infections; and, although a few patients developed some rounding of the face on this dosage, no serious side-effects have been observed. Occasionally patients who are going downhill have been temporarily improved subjectively by raising the dosage of cortisone to 75 mg. or 100 mg. daily, but the necessity for such an increase has always been an ominous prognostic sign signifying that the carcinoma was progressing rapidly.

The importance of a very substantial increase in cortisone dosage at the time of an acute infection or accident is discussed below.

Deoxycortone Acetate

Though cortisone 50 mg. daily provides adequate replacement therapy for the adrenal glucocorticoids, its effect on the metabolism of salt and water is by no means always so satisfactory, with the result that, unless additional therapy is given, arterial hypotension, excessive depletion of sodium with hyperkalæmia, and a rise in the blood-urea level may occasionally develop. While this complication can usually be avoided by giving large quantities of sodium chloride, the administration of a mineralocorticoid seems to be a wise procedure, and all our patients received an implant of deoxycortone acetate 300 mg. before discharge from hospital. Thirteen patients (nine adrenalectomies, four hypophysectomies) were slightly hypertensive in the ensuing months on this routine, but the blood-pressure of most of these had been slightly raised before operation, and in only one case were any symptoms reported which could in any way be attributed to hypertension. Three patients (two adrenalectomies, one hypophysectomy) required reimplantation at 9, 9, and 16 months because their blood-pressure was tending to fall to hypotensive levels.

Sodium Chloride

Sodium chloride in the form of capsules is not given routinely to our patients save in the immediate period following adrenalectomy. We do, however, use it as a "fine adjustment" to keep the blood-pressure in the normotensive range. It is given as salt capsules in doses of up to 4 g. daily. Patients who tend to have a raised blood-pressure are forbidden table salt. Additional sodium chloride was very rarely required in the hypophysectomy cases.

Special Maintenance Therapy after Hypophysectomy

Phenobarbitone.—To minimise the possibility of epileptic fits all the patients received phenobarbitone 30 mg. twice daily for a year after hypophysectomy. After discharge from hospital no fits occurred except in one patient who was known to have cerebral metastases.

Control of diabetes insipidus.—Thirst and polyuria, often severe, usually developed within a week of hypophysectomy, but occasionally the onset was delayed a month or more. They were temporary and cleared spontaneously between the 4th and 11th months in all the survivors. In many patients sleep was seriously disturbed. Satisfactory control was usually obtained by the insufflation of posterior-pituitary snuff 40 mg. from once to three times daily. One patient could tolerate only half this dose. In the early postoperative period injections of vasopressin tannate 5 mg. in oil were occasionally required each 2nd or 3rd day.

Thyroid.—Most patients showed a substantial gain in weight after hypophysectomy. Though this was partly due to an increase in appetite and general well-being, there can be no doubt that incipient thyroid deficiency often contributed to it. Some patients became frankly myxœdematous. These changes were not usually obvious until after the passage of several months, but in three cases they developed within a few weeks. In view of any possible effect it might exert on the carcinoma, it had been decided not to administer thyroid extract routinely, but in nine patients the onset of definite myxœdema made it essential. It was given by mouth in the dosage of 30 mg. twice daily, starting 2–18 months after the operation. The serum-cholesterol level, which in one case rose to 562 mg. per 100 ml., provided a simple satisfactory test for measuring the deficiency of thyroid during surveillance. The administration of thyroid did not appear to affect the neoplasm in any way, though the number of patients observed is too small for any statistical conclusions to be drawn. In fact, we feel that we were rather too hesitant in giving thyroid and consider that it should probably be administered to the majority of these patients after hypophysectomy.

Testosterone.—In view of the possible effect on the carcinoma, no patients in this series received testosterone at any time after these operations.

Management of Infections and Accidents

Although hypophysectomised or adrenalectomised patients can remain in good health on the maintenance therapy outlined above, the onset of an acute infection or the stress of an accident or an operation calls for a substantial increase in the adrenal steroids. As these patients cannot provide this from their own sources, fatal collapse may follow unless the cortisone dosage is increased. During any pyrexial illness, therefore, the daily amount of cortisone should be increased to about 150 mg., and this must be combined with large doses of antibiotics. Vomiting is a danger sign of incipient adrenal collapse; but it is sometimes absent, and the blood-pressure may remain within normal limits until a few hours before death.

The dictum that, because it depresses the natural response to infection cortisone should be withheld at these times cannot be too strongly condemned. It is equally important to combat the stress of an operation or an accident by a similar increase in dosage, and any adverse effect upon tissue healing is unimportant.

Three of our patients died after fracture of the femur:

In two cases, both adrenalectomies, the fracture was pathological and a Thomas splint was applied. Unfortunately they were admitted as emergencies, and the cortisone was continued at the maintenance dose of 50 mg. daily. Both patients died within 3 days.

The third case, a hypophysectomy, was particularly tragic because the patient was doing extremely well and the fracture was in a healthy femur. She was admitted to a hospital where she was not known and remained well for 4 days on her maintenance dosage of cortisone. On the 4th day the femur was exposed and pinned under general anæsthesia, and she collapsed with arterial hypotension and died within 12 hours.

If such tragedies are to be avoided, it seems sensible to give all these patients a letter or card stating the necessity for increasing the dosage of cortisone at times of stress, so that they can hand it to any doctor who may be called to attend them if they are taken ill or injured away from the care of their own practitioners, and we intend to introduce this procedure.

Method of Assessment of Results

To assess the value of any treatment applied to cases of advanced cancer at the breast clinic, and particularly in comparing one method of treatment with another, it has been necessary to use the "mean clinical value" (M.C.V.) system introduced by Walpole and Paterson (1949) whereby a number between 0 and 12 is assigned to the patient at each 4-weekly visit according to her response to treatment.

BEFORE TREATMENT

LESIONS : 1, left breast
2, left axilla
3, left supraclavicular
4, skin nodule

DURING TREATMENT

LESIONS : 1, left breast improved (2)
2, left axilla improved (2)
3, left supraclavicular unaltered (1)
4, new skin nodule (0)

(The appearance of a new lesion is marked 0.)

$$\text{M.C.V.} = \frac{\text{Total marks}}{\text{No. of lesions}} = \text{Average mark} \times 6 \text{ to produce a suitable number :}$$

Maximum = 12
No effect = 6
Minimum = 0

$$\text{In present case M.C.V.} = \frac{2+2+1+0}{4} \times 6 = 7{\cdot}5$$

Fig. 1—Assessment of mean clinical value.

The system is applied by establishing a base-line for each demonstrable lesion when the patient is first seen and before treatment is begun. Lumps are carefully measured, skin lesions photographed, radiographs of chest and skeletal lesions taken, and abnormalities measured and recorded. With the exception of pain, subjective symptoms have not been used as factors in determining response. The treatment is then applied and the patient seen again in 4 weeks' time. Each lesion is again assessed. If the lesion has improved it is given 2 marks ; if stationary, 1 mark ; and if worse, 0. The marks are then added, and the total is divided by the number of lesions, giving an average mark for the whole disease. Such a figure would be awkward to handle, so the result is multiplied by 6.

In this way, if all the lesions are responding, the average mark is 2 and the M.C.V. 12 ; if all the lesions are stationary, the average mark is 1 and the M.C.V. 6 ; and, if all are deteriorating, the M.C.V. is 0. When, as not infrequently happens, some lesions are responding and others are failing to respond or are deteriorating, any value intermediate between 0 and 12 may be obtained. The working of the scheme is illustrated by a hypothetical case in fig. 1.

Each 4 weeks the patient is reassessed and a fresh M.C.V. allotted ; in this way a chart of the patient's progress can be made, and a typical chart following, for instance, œstrogen therapy is shown in fig. 2. If one of the factors used in computing the M.C.V. is radiological, a new radiograph is not taken every 4 weeks but at every third visit—i.e., after 12 weeks have elapsed—and the previous value of the radiological factor is used to compute the M.C.V. in the two intervening assessments.

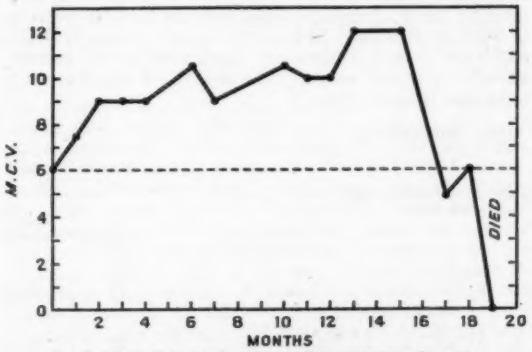

Fig. 2—Typical chart of progress after œstrogen therapy.

It must be understood that the state of any lesion is always compared with the *original* state of that lesion and not with its state at the previous visit. Thus a patient who has been responding to treatment may cease to respond and begin to deteriorate, but the deterioration is not reflected in the M.C.V. chart, because the lesions are still better than they were before treatment began. This is a weakness of the method which cannot be avoided and it accounts for the somewhat precipitate drop in the chart shortly before death. The workers at the breast clinic have, however, had many years' experience of this system and are convinced that it gives an accurate numerical assessment of the patient's response to treatment, particularly when comparative figures are required.

In comparing the results of a series of patients treated by one method with a series treated by another it is possible to construct two charts. One chart represents the average M.C.V. of all the patients after 1 month, 2 months, 3 months, and so on, treated by one of the two methods. The other does the same thing for the second method of treatment. In this way the general effect of the two methods of treatment can be compared at a glance (fig. 3). In constructing this chart, and to obtain the average in the later months, patients who have died maintain their representation on the chart with a mark of 0. Thus, when all the patients have died, both graphs reach zero.

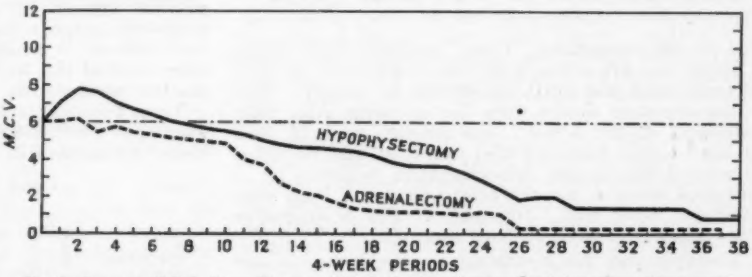

Fig. 3—Average M.C.V. (4-weekly records) of all adrenalectomy and hypophysectomy cases.

Results

Comparison of Groups

Although the thirty cases in each group were selected by random sampling, it was possible that, by chance, one group might have had a predominance of a particular type of case. Tables II–V have therefore been compiled to compare the more important preoperative features of the cases falling into the two groups. It can be seen that the incidence of these features in the two groups is about the same, indicating that they are comparable.

The diagnosis was confirmed histologically in twenty-six of the thirty patients in each group. In the eight cases not so confirmed the manifestations were so gross and characteristic that the diagnosis was not considered to be in any doubt.

Mortality and Morbidity

Adrenalectomy.—Of the thirty patients submitted to this operation twenty have now died. One of these deaths, from massive pulmonary collapse 24 hours after

TABLE II—AGE IN YEARS

Operation	Youngest	Oldest	Average
Adrenalectomy ..	39	69	53
Hypophysectomy ..	36	73	54

the first-stage adrenalectomy and oöphorectomy, is held to be due to the operation. If this case is included, four patients died within 1 month and nine within 3 months of operation. In one case, where the ovaries could not be removed because of massive pelvic secondaries, the operation was technically impossible.

There were few serious sequelæ as a direct result of the operation. Two patients had addisonian crises some months after operation, but both responded well to treatment. Two had depressive states during the first 2 months; one of these responded well to electroconvulsive therapy, but the other died from the carcinoma before psychiatry could be applied. Two patients died after pathological fracture of the femur; these have already been mentioned and were deteriorating rapidly at the time of their accidents. One patient developed an incisional hernia through the scar in one loin, but this was symptomless and needed no treatment.

Hypophysectomy.—Of the thirty patients submitted to this operation seventeen have now died. No death was due to the operation. Three patients died within 1 month and five within 3 months of operation; in none of these cases was death accelerated by surgery. Two of the seventeen deaths were due to causes other than carcinoma of the breast: one patient, aged 73, died of heart-failure 4 months after operation, and the other of arterial hypotension following open reduction of a fractured femur 6 months after operation; both were otherwise doing well. One patient had a depressive state which recovered without treatment.

TABLE III—MENSTRUAL HISTORY

Operation	Premenopausal	Menopausal	Postmenopausal	Unknown (hysterectomy)
Adrenalectomy ..	5	1	23	1
Hypophysectomy	3	3	21	3

The operation was technically impossible in one case owing to the abnormal configuration of the pituitary fossa. This patient subsequently underwent adrenalectomy and is therefore included in both groups, the M.C.V. for hypophysectomy being recorded as 0.

Some degree of diabetes insipidus developed in all cases, usually in the 1st week, but this complication was occasionally delayed until the 3rd week, and vasopressin, either as an injection of the tannate in oil in the acute stages or as snuff, was sometimes necessary. The symptoms progressively declined and were usually insignificant by the 6th month.

A bitemporal field defect was observed in six cases, but in only one did it cause trouble. Most of the patients had unilateral anosmia; a few had bilateral anosmia; and none complained of it.

Conclusions

The object of this investigation was to determine which operation (adrenalectomy or hypophysectomy) conferred greater benefit in cases of advanced cancer of the breast—without regard to the type of cancer or the patient's age. We wanted a statistically valid answer rather than a clinical impression.

Table VI shows that, of the patients who have already died, those who underwent hypophysectomy have survived on an average 2 months longer than those who underwent adrenalectomy. If all the cases are included the patients who underwent hypophysectomy survived on an average 4 months longer than those who underwent adrenalectomy. The longest survival after hypophysectomy was a year longer than the longest survival after adrenalectomy.

TABLE IV—RESPONSE TO HORMONES

Operation	Poor	Fair	Good
Adrenalectomy ..	19	9	2
Hypophysectomy ..	22	6	2

The progressive mortality of the two groups is given in fig. 4, which shows that during the period of follow-up the mortality-rate after adrenalectomy climbed more steeply than that after hypophysectomy.

By calculating the M.C.V. we have compared the degree of benefit conferred. When all the M.C.V. in both groups are recorded on the same chart, the picture is too confusing for immediate analysis. It may be simplified by taking an average of the M.C.V. at each 4 weeks of all the patients treated by one method and constructing a single-line graph exemplifying an average response for that method. A similar single line is constructed for the other method (fig. 3). In this way the relative effects of the two methods can be readily appreciated.

These findings (table VII) suggest that, in the circumstances of the investigation, if the ablation of endocrine tissue is indicated in a case of advanced cancer of the breast, hypophysectomy is to be preferred to adrenalectomy with oöphorectomy. We have been advised, however, by Dr. P. Armitage, who, with the kind coöperation of Prof. A. Bradford Hill, analysed our results, that this difference is not statistically significant in the conventionally accepted sense. The degree of significance is indicated in table VIII.

TABLE V—MANIFESTATIONS

Operation	Primary growth not removed	Secondaries in						
		Breast	Skin	Glands	Liver	Chest	Bone	C.N.S.
Adrenalectomy	8	11	16	18	6	8	18	3
Hypophysectomy ..	6	5	14	14	5	11	16	3

TABLE VI—SURVIVAL AFTER OPERATION

	Survival (expressed as the number of four-week periods survived) for each individual case																			Average length of survival (*weeks*)	
																				All patients	Dead patients
Adrenalectomy:																					
Alive	25	25	18	12	12	10	10	9	7	3											
Dead	17	16	16	15	13	12	8	6	4	4	3	2	2	2	2	1	0	0	0	0	32	24
Hypophysectomy:																					
Alive	38	35	28	25	24	23	18	13	13	9	7	6	2								
Dead	29	22	19	14	12	7	6	5	4	3	3	3	2	1	0	0	0				48	32

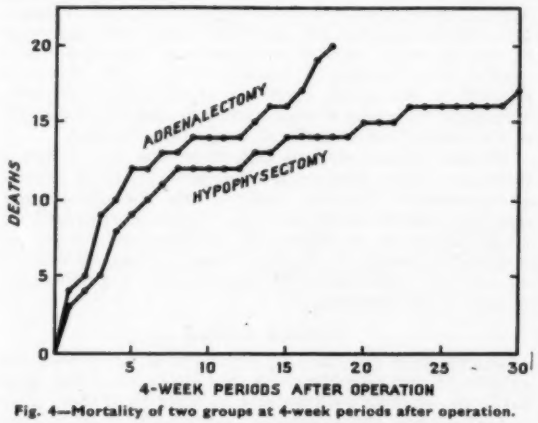

Fig. 4—Mortality of two groups at 4-week periods after operation.

Review of Reasons for Success or Failure

The fact that some cases respond while others do not may often depend on the nature of the growth—i.e., whether or not it is what Huggins has termed "hormone-dependent." On the other hand, certain other factors may be important. In the case of adrenalectomy, for instance, there may be accessory adrenal tissue which is at some distance from the operation site and is not removed at the operation, or other organs may take over the elaboration of œstrogen when the ovaries and adrenal glands have been removed. Furthermore, after this operation the growth-promoting hormone of the pituitary gland is unaffected, and this hormone may be of importance in maintaining the cancer.

TABLE VII—AVERAGE M.C.V.

M.C.V.	Hypophysectomy	Adrenalectomy
At 3 months	7·90	5·70
At 6 months	6·49	5·54
Last record	4·70	3·11
Average during survival ..	7·35	6·03

Likewise in the case of hypophysectomy the operation may not be complete. Other workers have assessed the completeness of the operation on the basis of certain tests of pituitary function, but in our experience these tests are inconclusive. Thus Luft and Olivecrona (1953, 1955) utilised the fall in the blood eosinophils with intramuscular injection of adrenaline, and the fall in the daily urinary excretion of 17-ketosteroids, as indicating how far pituitary function was destroyed. We, however, found that, in our patients, the blood-eosinophil levels were constantly so low (less than 100 cells per c.mm.) that the response to adrenaline was valueless. Again, probably because we gave rather larger doses of cortisone for maintenance therapy, the urinary excretion of 17-ketosteroids seldom decreased but stayed at 7–8 mg. per day. Ray and his collaborators (Pearson et al. 1956) relied on tests of thyroid function: they estimated the uptake of radioactive iodine and the amount of protein-bound iodine in the serum. We also used these tests, in nineteen of our patients, and likewise found that the levels fell to low or very low values, indicating much diminution of thyroid function. However, we were disappointed to find that this did not prove that the whole of the pituitary gland had been removed.

TABLE VIII—STATISTICAL EVALUATION OF RESULTS

M.C.V.	Difference between means ± standard error
At 3 months	2·20 ± 1·2 (t = 1·73; P = 0·09)
At 6 months	0·95 ± 1·44 (t = 0·66; P = 0·51)
Last record	1·60 ± 1·34 (t = 1·19; P = 0·24)
Average during survival ..	1·32 ± 0·97 (t = 1·35; P = 0·18)

Thus, in fatal cases which came to necropsy the pathologists usually reported that, to the naked eye, the pituitary fossa appeared empty. However, on careful histological examination, Prof. C. W. Harris and Dr. J. V. Cavanagh have found microscopic fragments of glandular tissue in all six cases so far examined, and provisional estimates place the amount of residual glandular tissue as 1–10% of the anterior lobe. In five of the cases so examined the patient had not responded to operation; but the sixth patient had benefited considerably and died after an operation for traumatic fracture of the femur 6 months after hypophysectomy while the carcinomatous lesions were still regressing. Thus an absolutely complete hypophysectomy is not essential for producing regression.

We must face the fact that, in some of our surviving patients, the hypophysectomy, although extensive, may still have been incomplete, and therefore we must consider other explanations of the benefit. Several workers have shown that, in laboratory animals, if the pituitary stalk is cut through and an obturator is inserted to prevent reunion of the stalk with the gland, the gonadal, adrenal, and thyroid functions will be depressed in much the same way as after complete hypophysectomy (Harris 1955). In such circumstances the anterior lobe of the pituitary gland often shows histologically only slight necrosis. The essential factor appears to be the interruption of the portal venous circulation of the pituitary gland; for if the stalk is allowed to reunite with the gland, the portal circulation regenerates and the animal regains its normal endocrine functions. How far these experimental observations can be applied to man is not yet known.

Dorothy Russell (1956) has reported that, in two patients operated on for craniopharyngioma, extensive necrosis of the pituitary gland followed section of its stalk without insertion of an obturator. Neurosurgeons who have divided the pituitary stalk for breast carcinoma have subsequently found only a small proportion of the anterior lobe atrophic (Connolly 1956, Le Beau 1956).

A controlled trial of surgical hypophysectomy versus section of the pituitary stalk (with precautions to prevent its regeneration) therefore seems necessary to elucidate the rationale of our operation; for not only did we divide the pituitary stalk and attempt to remove the gland but also we inserted an acrylic plate to prevent regeneration of the portal circulation to any fragments which might remain.

Comment

In this clinical experiment the differences between the results of hypophysectomy and those of adrenalectomy in the treatment of advanced carcinoma of the breast are not statistically significant. Nevertheless there is a definite trend in favour of hypophysectomy; and it may well be that, with larger numbers of patients, significant differences will appear. It must be realised, however that these results depend on a first-class neurosurgical service, and today facilities are not yet available for all patients to be submitted to hypophysectomy.

For this reason we are interested in alternative methods of destroying the pituitary gland, such as those practised in this country by Forrest and Peebles Brown (1955). We hope that, with the coöperation of the authorities of Liverpool University, it will be possible to utilise the techniques described above to compare the clinical course of a series of cases treated by surgical hypophysectomy with that of a series in which the hypophysis has been destroyed by proton bombardment with the synchro-cyclotron.

Further investigation into the relative merits of hypophysectomy and pituitary-stalk section is also planned.

Summary

A controlled series of patients with advanced cancer of the breast were operated on—half by adrenalectomy with oöphorectomy, and half by hypophysectomy.

The type of operation was decided by random selection.

The results of these operations were compared by the method of "mean clinical value" and by the survival-rate.

In the circumstances of the investigation the overall results of hypophysectomy seem to be superior to those of adrenalectomy with oöphorectomy, but the results are not statistically significant.

Neither operation appears to hold out prospects of permanent cure. Possible reasons for this are discussed.

Our thanks are due to Dr. P. Armitage, of the department of medical statistics at the London School of Hygiene and Tropical Medicine, for analysing our results statistically; to the Editor of the *Leeds Medical Journal* for permission to reproduce figs. 1 and 2, and to Miss J. Thorne for her accurate and painstaking work in keeping the M.C.V. records. We thank Miss Sylvia Treadgold for her help in producing the diagrams. We are also indebted to Prof. G. W. Harris for his advice; to Dr. J. G. Gibson and Dr. J. H. Ray for the radio-active-iodine studies; to Dr. R. C. Willcox for determining the protein-bound iodine; and to Dr. P. J. Helliwell for a note on the anæsthesia.

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THE EXCRETION OF 17-KETOSTEROIDS IN THE URINE OF PATIENTS WITH GENERALISED CARCINOMATOSIS SECONDARY TO CARCINOMA OF THE BREAST

BETTY J. ALLEN
B.Sc. Lond.
RESEARCH ASSISTANT, DEPARTMENT OF CLINICAL PATHOLOGY

J. L. HAYWARD
M.B. Lond., F.R.C.S.
ASSISTANT TO THE DIRECTOR OF THE DEPARTMENT OF SURGERY

W. H. H. MERIVALE
M.B. Lond., M.R.C.P.
DIRECTOR OF THE DEPARTMENT OF CLINICAL PATHOLOGY

GUY'S HOSPITAL, LONDON

IN an accompanying paper Atkins et al. (1957) have compared the results of adrenalectomy with those of hypophysectomy in the treatment of 60 cases of mammary carcinomatosis. From the outset of their investigation it was clear that a preoperative criterion was needed to distinguish which patients were likely to benefit from either procedure. The importance of having such a criterion is emphasised by their observations that only half of the cases showed any improvement from either operation.

It seemed possible that the solution of this problem might be found in differences in the preoperative excretion of hormones by such patients. For this reason it would be useful to have a complete picture of the urinary excretion of pituitary, sex, and adrenocortical hormones. When our work started, however, the methods available for estimating pituitary hormones and œstrogens were in various ways open to criticism and were not easily applied as a routine in the laboratory. We therefore decided to study the excretion of the 17-ketosteroids, because these reflect to some extent the hormonal activity of the adrenal cortex and can easily be estimated.

It soon became obvious that there was no significant difference in the preoperative excretion of total neutral 17-ketosteroids between patients who benefited from operation and those who did not. We therefore turned our attention to the study of the 17-ketosteroid fractions obtained by chromatography of the total neutral fraction on alumina columns. This paper gives a preliminary report on our findings.

Patients Studied

The 60 cases described by Atkins et al. have been the subject of our investigation; but, because of the time taken to complete each estimation, only 15 of them have so far been completely studied. Of these 15, 7 underwent adrenalectomy and 8 hypophysectomy (table I). The youngest was aged 40, the oldest was 59, and all were postmenopausal except for 2 who were at the menopause and 1 who had had a previous hysterectomy. All had had male hormones preoperatively, except 1 who had had stilbœstrol only; 4 had taken both male and female hormones. The table shows the specific hormone taken immediately preoperatively and the interval between the last dose and the first collection of urine. It also shows the sites of the secondaries and whether the primary growth was removed or not. The longest-surviving patient has been followed up for twenty-four months and the shortest-surviving for seven months; 7 deaths are indicated by asterisks.

Methods

On admission to the ward urine was collected for seventy-two hours from each patient. Further seventy-two-hour collections were obtained after operation at intervals of a fortnight, a month, three months, and six months. These collections were preserved with crystalline thymol and salicylic acid (Bisset et al. 1948). We deal here only with the preoperative collections.

Extracts from the seventy-two-hour collections of urine were prepared according to the technique of Dingemanse et al. (1952). Their method was then modified as follows:

Aliquots of each extract containing 8–12 mg. of total neutral 17-ketosteroids, dissolved in 10 ml. of benzene, were adsorbed on columns containing 30 g. of alumina equilibrated over 19·7–21·0 *N* sulphuric acid. The chromatograms were developed with benzene, benzene plus 0·1% ethyl alcohol, benzene plus 0·5% ethyl alcohol, and benzene plus 2·0% ethyl alcohol. The total Zimmermann-reacting substances (Zimmermann 1935) in each fraction were then estimated by the method of Holtorff and Koch (1940).

This method permits the separation of 11-deoxy-17-ketosteroids from those with a carbonyl or hydroxyl function at the eleventh carbon atom. The 11-deoxy 17-ketosteroids consist primarily of etiocholanolone, dehydroepiandrosterone, androsterone, and their derivatives. These compounds are the metabolites of testosterone, Δ 4 androstene-3-17-dione and dehydroepiandrosterone; to a lesser extent they reflect the metabolism of certain of the adrenocortical C^{21} steroids having a hydroxyl group at the seventeenth carbon atom but lacking a carbonyl or hydroxyl function at the eleventh carbon atom. They are eluted from the column in fractions 20–60. In fractions 65–85 are eluted 17-ketosteroids having a hydroxyl or carbonyl group at the eleventh carbon atom. This group includes 11 hydroxyetiocholanolone, 11 hydroxyandrosterone, 11 ketoandrosterone, and 11 ketoetiocholanolone. They are present in the urine as the metabolic end-products of the metabolism of cortisone, hydrocortisone, and adrenosterone.

TABLE I—CLINICAL DETAILS OF 15 PATIENTS WITH MAMMARY CARCINOMATOSIS

Case no.	Age (yr.)	Menopause	Preoperative treatment with hormones	Hormone taken before first collection of urine	Interval between last dose and first collection of urine	Primary growth removed	Secondaries in						
							Breast	Skin	Gland	Liver	Chest	Bone	C.N.S.
1*	50	At	Male	Testosterone propionate	4 days	+	..	..	+	+	..	+	..
2*	59	Post	Male	Testosterone propionate	3 mos.	+	+	+	..	..	..	+	..
3*	47	Post	Male	Testosterone propionate	2 mos.	+	..	..	+	..	..	+	..
4*	55	Post	Female	Stilbœstrol	5 mos.	+	+	+	+	..	..	..	+
5*	55	At	Male	Testosterone propionate	7 weeks	+	..	+	+	..	..	+	..
6	56	Post	Female and male	Testosterone propionate	8 mos.	..	..	+	+	..	..	..	..
7	54	Post	Male	Testosterone propionate	5 days	+	..	..	..	..	..	+	..
8	55	Post	Female and male	Methyl testosterone	3 days	+	..	..	+	..	+	+	..
9	52	Post	Male	Testosterone propionate	2 days	+	..	..	..	..	..	+	..
10*	53	Post	Male	Testosterone propionate	33 days	+	+	+	+	..	..	..	..
11	40	Hysterectomy	Male	Testosterone propionate	10 days	..	..	..	+	..	..	+	..
12*	52	Post	Male	Testosterone propionate	12 days	+	+	+	+	..	..	+	..
13	53	Post	Female and male	Methyl androstenediol	30 days	..	+	+	+	..	..	..	..
14	56	Post	Male and female	Stilbœstrol	During collection	+	..	..	+	+	..	..	..
15	48	Post	Male	Testosterone propionate	7 weeks	+	..	..	+	..	+	+	..

* Died.

The method has certain well-known limitations:

(1) We did not use any preliminary separation into ketonic and non-ketonic fractions with Girard's reagent T. This has the effect of introducing an error into the colorimetric computation of our results owing to the presence of non-ketonic chromogens in some fractions.

(2) Peaks which are represented on the charts do not contain one steroid alone but probably contain one which is there in predominant quantity and, possibly, several others which may be eluted with the main one in very much smaller quantities—i.e., the method, as we used it, does not permit the resolution of very closely related substances. For these reasons we do not attach much quantitative significance to the concentration of steroid found in each individual peak.

(3) The acid hydrolysis of steroid conjugates in urine, which is used in this method, dehydrates trace amounts of 11-hydroxylated-17-ketosteroids to their Δ 9 derivatives which are eluted in group I.

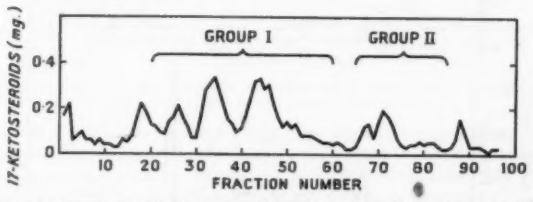

Fig. 1—Excretion of 17-ketosteroid fractions in pooled urine from 20 healthy people.

(4) In our hands the method has proved extremely time-consuming, and we do not consider it suitable in its present form for routine use.

However, in view of the results we have obtained we consider it reasonable to compare the amount of steroids present in the first group (fractions 20–60) with the total amount of steroid material in the second group (fractions 65–85). This we have expressed as a ratio of the total amount of substances reacting with Zimmermann's reagent in group I to the total amount of substances giving the same reaction in group II.

Results

The results can be shown graphically by plotting the quantity in each fraction against the fraction number When these plots are joined by a continuous line, it can be readily seen, by the peaks produced, in which fractions the 17-ketosteroids appear in greatest amounts.

Fig. 1 is the graph obtained for the 17-ketosteroids of pooled normal urines. Breakdown of individual normal urines has shown that this is a representative picture. If the total ketosteroids are worked out for the two groups in this figure, it is found that group-I derivatives exceed group II in relative quantity by about 4 : 1 (4·1). This ratio naturally varies from one normal to another; but, if the quantity in group I is divided by that in group II, the result is usually about 3 or 4 and always more than 1.

Fig. 2 shows the graph obtained from the urine of a patient about to undergo hypophysectomy, and it can

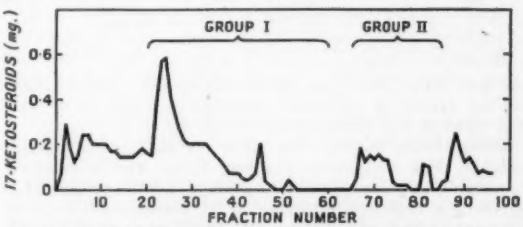

Fig. 2—Preoperative excretion of 17-ketosteroid fractions in a patient who benefited from operation (case 7).

be seen that it is essentially normal in this respect. The ratio of group I to group II is 3·7.

We have now investigated the preoperative urines of 15 patients and have calculated the ratio of group I : group II in each case. The result is shown in table II, together with the total 17-ketosteroids of these patients. It can be seen that, although there is some variation from the normal, in 11 of the 15 cases the ratio is more than 1.

In view of the 4 discrepant cases we tried to correlate the ratios of group I : group II with clinical response to operation. To do this we have used the "mean clinical value" (M.C.V.) method of assessment (Walpole and Paterson 1949; see also Atkins et al. 1957).

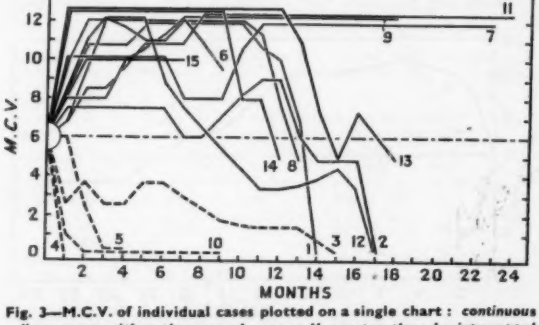

Fig. 3—M.C.V. of individual cases plotted on a single chart: *continuous lines*, cases with ratio group I : group II greater than 1; *interrupted lines*, cases with ratio less than 1.

Fig. 3 shows the result obtained when the M.C.V. records for these 15 patients are plotted on a single chart. It can be seen that, of these 15, 11 gave a fair to good response to either adrenalectomy or hypophysectomy, and that 4 showed no response at all and went straight downhill. The graphs in fig. 3 have been numbered to correspond with the case numbers in table II. Comparison reveals that the 4 patients who did badly are those in whom the ratio was less than 1—i.e., in these 4 patients the normal ratio of group-I : group-II 17-ketosteroids was reversed. If all the M.C.V. records of those patients with ratios greater than 1 are resolved to a single line, and the same done with those with ratios less than 1, the difference is more striking (fig. 4). The charts of the fractional 17-ketosteroid excretion for these 4 patients are shown in detail in figs. 5–8. It is, of course, impossible to say whether they had an excess of corticoid products in group II or less than normal androgenic products in group I.

TABLE II—RATIO GROUP I TO GROUP II, AND TOTAL NEUTRAL 17-KETOSTEROIDS EXCRETED IN 72 HOURS

Case no.	Ratio	Total 17-ketosteroids (mg. per 72 hr.)
1	1·2	6·2
2	1·4	24·0
3	0·9	12·3
4	0·9	9·2
5	0·9	22·0
6	1·6	13·2
7	3·0	10·6
8	2·6	14·0
9	1·7	31·0
10	0·4	46·0
11	3·7	10·2
12	3·4	28·0
13	1·9	12·0
14	1·2	10·9
15	3·0	23·7

Kellie (1955) found that, in a certain proportion of patients with neoplastic disease, there was a relative decrease in the excretion of 11-deoxy-17-ketosteroids and therefore a higher proportion of 17-ketosteroids with a carbonyl or hydroxyl group at C 11. Pincus et al. (1955) found this to be a normal feature of ageing in healthy people. The ages of the present 4 patients who showed a reversion of their excretion ratio of group-I (11-deoxy-17-ketosteroids) to group-II (11-oxy-17-ketosteroids) were 47, 55, 55, and 53; hence it seems unlikely that ageing could have explained the finding. We have no data on the ratio of group I : group II in healthy women of these ages, but Pincus et al. (1955) found that, even in women aged 70–79, the sum of the quantities of androsterone and etiocholanolone excreted in the urine exceeded that of the 11-oxygenated and 11-hydroxylated derivatives of these substances.

Segaloff et al. (1951) found that patients with mammary carcinomatosis who did not respond to treatment with testosterone propionate had an increased urinary excretion of glycogenic corticoids during treatment, whereas the patients who benefited from treatment had a decreased excretion of glycogenic corticoids. They regarded this finding as of doubtful significance.

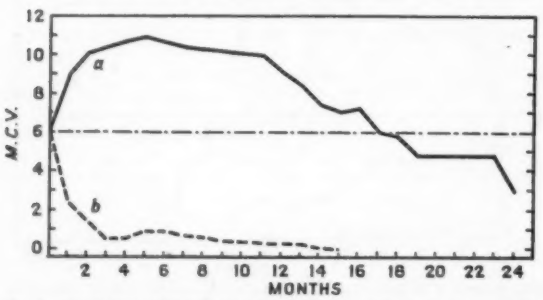

Fig. 4—Resolution of M.C.V. into two lines : *a*, ratio group I : group II greater than 1 ; *b*, ratio less than 1.

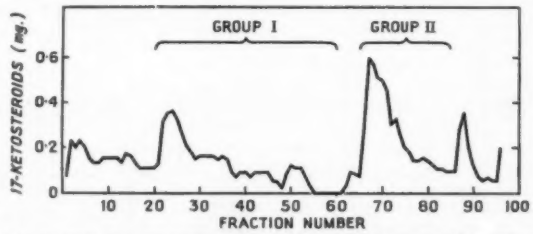

Fig. 5—Case 3 : preoperative excretion of 17-ketosteroid fractions (patient did not benefit from operation).

Discussion

Treatment of advanced mammary carcinoma by altering the endocrine balance by various means is not new (Beatson 1896, De Courmelles 1922, Farrow and Woodard 1942, Haddow et al. 1944). It was in 1941 that Huggins and Hodges described as "hormone-dependent" those tumours of the prostate which responded to this type of treatment. So long as treatment was by administration of sex hormones, the diagnosis of hormone dependency was a therapeutic one; but with the advent of major surgery (Huggins and Bergenstal 1952, Perrault 1952) it became desirable to foretell before operation which patients were likely to benefit. Since then many attempts have been made to assess hormone dependency by various methods. Emerson and Jessiman (1956) treated patients having bony metastases with provocative doses of stilbœstrol and measured the urinary calcium while the patients were on a constant dietary intake of calcium. A rise in the urinary excretion of calcium indicated that the tumours were hormone-dependent. These workers further tested their patients by administering cortisone; and, if the urinary calcium fell and subjective symptomatic improvement occurred, they concluded again that the tumours were hormone-dependent. It seems to us that this method has the following disadvantages: (1) it is only applicable to patients with bony metastases; and (2) the provocative doses of stilbœstrol may initiate a sudden deterioration in the patient's general condition which calls for immediate operation.

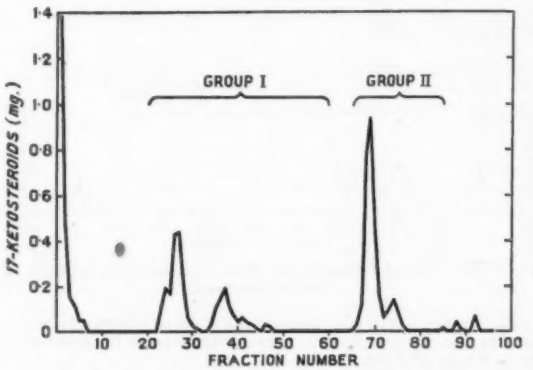

Fig. 6—Case 4 : preoperative excretion of 17-ketosteroid fractions (patient did not benefit from operation).

We would like to have estimated the mammotrophic potency of our patients' urine (Hadfield 1956), but with the facilities at our disposal this was not possible.

Huggins and Dao (1952) thought that the histological characteristics of the tumour might indicate the suscepti-

bility to endocrine treatment in certain cases, but this has not been the experience of one of us (J. L. H.) in the present series. Furthermore Wolff (1957) has failed to correlate preoperative mitotic cell counts with response to treatment.

We do not suggest that our findings necessarily indicate hormone dependency in the tumours of the patients investigated; nor at this stage are we prepared to make any deductions from them about the relative proportions of the various adrenocortical steroids secreted (Dorfman 1954).

Not unexpectedly, in our studies of postoperative excretion of 17-ketosteroids, we found that in every case there was a complete reversal of excretion pattern compared with the normal: steroids of group I were almost completely absent, whereas those of group II were much increased. This presumably reflects the metabolism of the cortisone on which these patients were maintained. a similar suggestion has been advanced by Strong et al. (1956). An example is given in fig. 9.

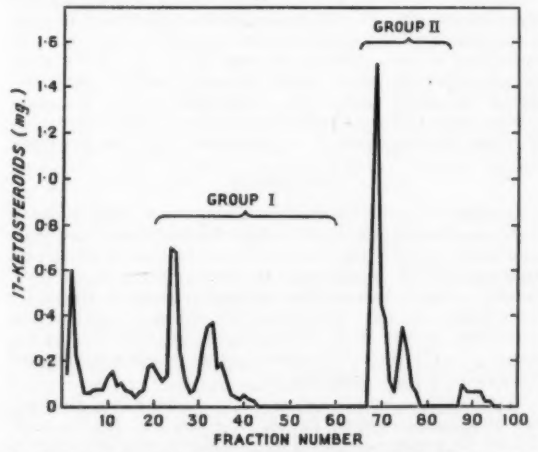

Fig. 7—Case 5: preoperative excretion of 17-ketosteroid fractions (patient did not benefit from operation).

The similarity between this excretion pattern and that obtained preoperatively in the 4 patients in this series who did not respond to operation is striking. From this it seems possible that the operation failed in these 4 cases because it did not alter decisively the internal hormonal environment, at least in as much as this is reflected in the results of fractional determination of 17-ketosteroids.

The success or failure of an operation therefore may depend on its ability to produce a sudden change, with all its cellular metabolic consequences, in the hormonal environment of the tumour. It is, however, common experience that operation merely defers the progress of

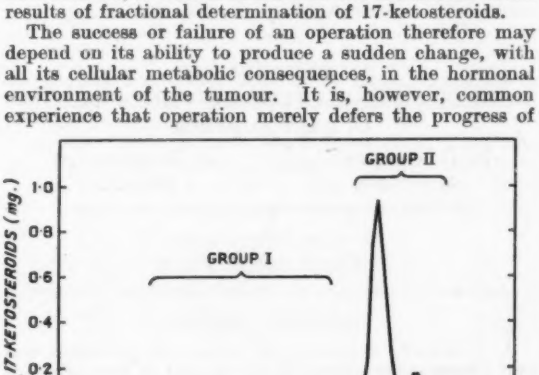

Fig. 8—Case 10: preoperative excretion of 17-ketosteroid fractions (patient did not benefit from operation).

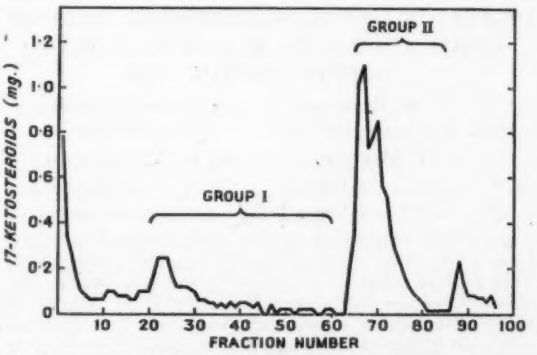

Fig. 9—Excretion of 17-ketosteroid fractions a month after operation (patient maintained on cortisone 50 mg. daily).

the disease, and sooner or later all patients relapse. It is therefore not impossible, in view of the similarity of the preoperative excretion of these 4 patients to that obtained after operation, that they had previously undergone a change in hormonal environment, from which they may or may not have benefited, and were at the time of coming to operation in the terminal stages of their disease.

Summary

The excretion of the fractions of total neutral 17-ketosteroids in the urines of 15 patients with mammary carcinomatosis has been studied. 11 patients benefited from either adrenalectomy or hypophysectomy, and 4 did not.

The ratio of 11-deoxy-17-ketosteroids to 11-oxygenated or -hydroxylated-17-ketosteroids has been estimated in these patients.

In those patients who benefited from operation the ratio was greater than 1 and the excretion pattern approximated to that found in healthy subjects. In those who did not benefit the ratio was less than 1 and the excretion pattern closely resembled that found after operation.

These results are discussed.

We are grateful to Mr. H. J. B. Atkins, of the department of surgery, Guy's Hospital; Mr. Murray Falconer, of the Guy's-Maudsley Neurosurgical Unit; and Dr. K. S. MacLean, of the department of medicine, Guy's Hospital, for permission to study their patients; and Miss A. M. Norton for help with the technical work.

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ISOLATION OF VIRUSES RELATED TO ECHO VIRUS TYPE 9 FROM OUTBREAKS OF ASEPTIC MENINGITIS

G. P. B. BOISSARD, B.Sc., M.B. Lond., Dip.Bact.
L. JOAN STOKES, B.Sc. Adelaide
A. D. MACRAE, M.D. Aberd., Dip.Bact.
F. O. MACCALLUM, B.Sc., M.D. Toronto

From the Virus Reference Laboratory, Colindale, London

BETWEEN September and December, 1955, material from patients in an outbreak of aseptic meningitis in East Suffolk (Garnett et al. 1957) was received at the Virus Reference Laboratory, from Dr. P. H. Martin of the Public Health Laboratory, Ipswich. The material consisted of throat-washings, cerebrospinal fluid (C.S.F.), fæces, and paired samples of serum.

Virus Investigations

The C.S.F.s, throat-washings (after centrifugation at low speed to remove gross debris), and bacteria-free fæcal suspensions were inoculated into tissue-culture tubes of HeLa cells and of monkey-kidney first-passage cells. Three tubes of each cell type were used per specimen. The inoculum consisted of 0·5 ml. per tube of C.S.F., throat-washing, or 10% fæcal suspension, but in some instances 0·1 ml. of a fivefold ultracentrifuge concentrate of fæcal suspension was used. After preliminary incubation for one hour at 37°C the fluids were removed and replaced with fresh medium. Cytopathogenic agents were readily isolated in monkey kidney but not in HeLa cells. Details of the isolations are given in the accompanying table. The newly isolated strains of virus were not neutralised by antiserum against the three types of poliomyelitis virus or against the Coxsackie viruses group A type 9 or group B types 1–5 inclusive.

ISOLATIONS FROM EAST SUFFOLK MATERIAL

—	No.	Last day, post-onset, of a positive specimen	Virus isolated	No virus isolated
Patients ..	11	..	7	4
Fæces ..	11	10th	6	5
Gargles ..	10	3rd	4	6
C.S.F.s ..	9	4th	5	4

Intraperitoneal inoculation into mice less than 24 hours old with first- or second-passage tissue-culture-fluid suspensions of these strains resulted in varying degrees of paralysis amongst each litter, a proportion of the inoculated mice dying while others remained apparently unaffected. Signs of infection in the mice were usually present four to five days after inoculation. Histological examination of affected mice showed a generalised necrosis of varying severity in the skeletal muscles; the central nervous system and the visceral organs were unaffected. The lesions suggested an infection by the Coxsackie-A group of viruses.

Serological Investigations

A number of sera showed in both neutralisation and complement-fixation tests that there was no evidence of recent infection by the poliomyelitis viruses. Tests by Dr. P. S. Gardner for evidence of infection with the influenza A, B, and C viruses, the adenovirus group, mumps, psittacosis-group viruses, lymphocytic choriomeningitis virus, and *Rickettsia burneti* were negative, as were tests for leptospiral infection.

All convalescent sera tested showed high neutralising antibody titres against one of the newly isolated strains of virus, and two patients had a greater than fourfold rise in neutralising antibody against their own strain of virus during the course of illness. An antiserum prepared in a rhesus monkey against one of the strains of virus neutralised the homologous virus and also all the other strains isolated. This antiserum subsequently has been found to neutralise virus strains isolated during 1956 from outbreaks of aseptic meningitis in Nottingham, Leicester, Sheffield, including the Haynes strain (Tyrrell and Snell 1956), Coventry, Hereford, South Middlesex, West Germany, and a strain obtained from Dr. A. Rhodes, Hospital for Sick Children, Toronto, where it had been isolated from a child in the course of an outbreak of aseptic meningitis similar to that reported by Garnett et al. (1957).

This antiserum also neutralised two strains of virus isolated at the Virus Reference Laboratory from the Bourn outbreak of aseptic meningitis (McLean and Melnick 1957), the prototype Hill strain of Echo virus type 9 received from Dr. A. B. Sabin, and strains of virus isolated from babies during an outbreak of mild meningitis in East London in 1954 (Crawford et al. 1956).

There have been two features of interest in the 1956 outbreaks from which these serologically related viruses were recovered: (1) the presence of a rash noted in only a *proportion* of the patients who excreted virus; and (2) the effect of these viruses on newborn mice. Even after one or two passages in tissue-culture a number of strains failed to affect such mice, although others, including strains from the same outbreak, readily induced paralysis. Further investigation of this phenomenon is in progress.

Summary

Strains of virus, related to Echo virus type 9, have been recovered from cerebrospinal fluids, throat-washings, and fæces of patients in a number of outbreaks of aseptic meningitis. A proportion of these strains have been found to cause lesions of a Coxsackie group-A character in newborn mice. Rising or high titres of neutralising antibody against these viruses have been observed in the serum of patients, and tests with other possible ætiological agents have been negative.

Acknowledgment is made to Dr. J. L. Hamilton Paterson for histological reports, Dr. A. B. Sabin and Dr. D. A. J. Tyrrell for strains of virus, Dr. P. H. Martin and all those who submitted material for investigation, and Dr. P. S. Gardner for the results of serological tests.

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AN OUTBREAK OF ASEPTIC MENINGITIS OF VIRUS ORIGIN IN EAST SUFFOLK

D. G. GARNETT, M.B. Camb.
A. BURLINGHAM, M.R.C.S.
GENERAL PRACTITIONERS, LEISTON, SUFFOLK
D. VAN ZWANENBERG, B.M. Oxfd, D.P.H., D.C.H.
ASSISTANT PHYSICIAN, ST. HELEN'S HOSPITAL, IPSWICH

The Leiston Outbreak

A SYNDROME suggestive of meningeal irritation was first observed by one of us (D. G. G.) in two adjacent villages a mile to the south of Leiston, at the beginning of September, 1955. These early cases occurred among young adults, predominantly male, and were the most severe of the outbreak. They presented three essential symptoms: (1) very intense and intractable headache,

(2) equally intractable vomiting, and (3) fever. The illness was marked by short duration and an early return to work. Soon cases began to appear among children and became more varied in symptomatology and duration, and, generally speaking, milder. The disease, which was unlike any in our experience, appeared to be neither poliomyelitis nor cerebrospinal fever, although in some ways resembling both.

New cases appeared every other day, and after a fortnight the infection spread into Leiston, mainly on a new housing-estate, so that by the end of the month we had seen 80 cases. In October further cases appeared in various parts of the town, and there was a small spread to a village 3 miles to the north. Dr. P. M. Acheson, of Aldeburgh (4 miles to the south), informed us that he had experienced at the time, or shortly before, cases similar in type, while Dr. A. L. Forster, of Yoxford (6 miles north of Leiston), had 1 severe case which was found to be a definite contact of one of our early cases, and which he had admitted to hospital. Information was also received that an outbreak comparable in character had occurred in Lowestoft (25 miles to the north) in August (Hughes 1955, Eastwood 1956).

Finally, the local infection died out at the beginning of November, by which time we had seen upwards of 130 cases from 90 houses (2 or more cases in 25 houses) from a population of 5500. The cases involved all ages up to 50, with 40% appearing in the primary-school age (5–11).

Symptoms were of varying intensity, and after an incubation period of two to four days consisted of any or all of:

(1) Fever lasting up to four days, usually 100–101°, sometimes 103°, and in one patient 105°F (a boy of 6).

(2) Frontal headache, always described as across the forehead or behind the eyes.

(3) Nausea and vomiting, frequent at the onset and incessant for two or three days in severe cases.

(4) Pain of the neck and shoulders in more than half the patients, demonstrated by inability to flex the head to the knees. This ceased when patients became afebrile.

(5) Flushed face, suffused eyes, and photophobia.

(6) Oral fœtor and a white tongue.

(7) Rash in over 25% of cases (all except 3 in children). This usually appeared on the third day and consisted of blotchy reddish purple or pink macules on the face with or without a mixed rubelliform eruption on the neck, trunk, and extremities, which faded without staining in two or three days. Numerous petechiæ on the trunk were present in 1 case.

(8) Relapse occurred in 7 cases (3 of which were in children), up to six days after the onset, and was often worse than the initial attack.

Recovery was complete in every instance, usually in two to five days, without paralysis, lymphadenopathy, or other residual effect.

On the advice and with the coöperation of Dr. P. H. Martin, of the Ipswich Public Health Laboratory, serum, garglings, and fæces were sent to the Virus Reference Laboratory, Colindale, in the following two cases.

A girl of 15 was the 2nd case in a family of 11. In this family 7 children were involved over a period of nine days. She had a flushed face with fever, vomiting, and backache, and recovered in four days. The specimens were taken on the second day and blood was also taken after ten days and three months.

A woman of 24 had fever (101°F) and frontal headache for two days, and on the third day felt better and went out shopping. The following day her son, aged 6 years, was feverish with headache and backache. That evening she had a return of headache and fever which was worse the next day when the specimens were taken. Blood was also taken after ten days and three months.

AGE-DISTRIBUTION OF CASES

Age group (yr.)	0–4	5–11	12–18	19–29	30–39	40–49	51	Total
Male	10	30	12	8	9	4	..	73
Female.. ..	13	23	5	11	4	2	1	59

Cases Admitted to Hospital

Some of the most severe cases of this illness in the region were admitted to hospital in Ipswich. At first these came from the Leiston area. As the epidemic spread there were further cases from the areas between Leiston and Ipswich, and finally a small series of cases came from Bramford to the north-west of Ipswich.

Of the 15 hospital cases 14 were admitted because of signs of meningeal irritation; the other patient developed a pneumonia following a particularly severe bout of vomiting.

While the patients were in hospital the distinction from non-paralytic poliomyelitis and other virus meningitis was not always clear. In comparison with equivalent cases of poliomyelitis, these patients complained of more severe headache, and considerably more vomiting, and they all had a characteristic white furred tongue. Only 3 patients developed rashes while in hospital. The rash appeared on the face and upper trunk, rather bluish red with ill-defined margins, macular, but in irregular "blotchy" patterns. The rash lasted one or two days.

A lumbar puncture was performed on 11 of the patients. The abnormalities in the cerebrospinal fluid (C.S.F.) varied slightly, depending on the day of illness. The C.S.F.s obtained early in the illness showed high cell-counts of the order of 200–1000 cells per c.mm. with polymorphs predominating, but fluids collected later in the illness, as in other types of virus meningitis, showed a considerable predominance of lymphocytes. On the whole, cell-counts were higher than one would expect to find in cases of non-paralytic poliomyelitis of similar severity. The total protein in the 11 cases was never found to exceed 60 mg. per 100 ml., and in 6 out of the 11 it did not exceed 30 mg. per 100 ml. Headache and vomiting were considerably relieved by lumbar puncture. All patients made a complete recovery without any specific treatment. White-cell counts were within normal limits and Paul-Bunnell tests were negative. Specimens of fæces from 9, gargle from 8, C.S.F. from 9, and sera only from 7 were sent to the Virus Reference Laboratory from 15 of these cases, and from a similar case that was admitted to the local general hospital.

Strains of virus were isolated from the girl of 15 described above and from 7 of the hospital patients and, as described by Boissard et al. (1957), they were all immunologically similar and were related to the Echo-9 type of enteric virus (Committee on Echo Viruses 1955).

Summary

An illness occurred in Suffolk in September, 1955, which we had not seen before. The predominant signs and symptoms were fever, headache, nausea and vomiting, pain in neck and shoulders, flushed face, photophobia, and, in about 25% of the cases (mostly children), a macular rash, often rubelliform in type. Recovery was usually rapid and always complete, without paralysis or other residual effects.

A large number of cells were present in the spinal fluid of the patients admitted to hospital; these were predominantly polymorphonuclear leucocytes in the early stage, and lymphocytes later.

Strains of virus immunologically related to the Echo-9 type of enteric virus were isolated from the cerebrospinal fluid of 5 patients, from the stools of 6, and from throat washings of 4.

We wish to thank Dr. J. W. Paulley for permission to include details of the case admitted under his care; Dr. R. Wilton and Dr. I. Staddon who sent some of these cases into hospital for investigation and subsequently collected further specimens for investigation; and Dr. P. H. Martin, Public Health Laboratory, Ipswich, for laboratory examination of the cerebrospinal fluids.

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MENINGITIS OF VIRUS ORIGIN

CHAVA EVE ROTEM
M.D. Lausanne
MEDICAL REGISTRAR,
LEICESTER ISOLATION HOSPITAL AND CHEST UNIT

IN July, 1956, the first examples of what appeared to be a new type of aseptic meningitis were admitted to the Leicester Isolation Hospital and Chest Unit. This disease, apparently widespread all over England, was most prevalent in the Midlands. Descriptions of a similar illness appeared under such titles as Trent valley fever, Nottingham meningitis (*Lancet* 1956), lymphocytic meningo-encephalitis (Lyle 1956a), and seasonal aseptic meningitis (Karzon et al. 1956). This paper gives a brief description of findings in the first 100 cases admitted to the Leicester Isolation Hospital between July 4 and Nov. 23, 1956.

Incidence

It is impossible to assess the number of cases in the population at large, because the disease is not notifiable and many cases were not admitted to hospital. Of the 100 patients admitted to hospital, 58 were male and 42 female. The age-distribution is shown in table I; and the way in which the cases were divided between city and county, month by month, is set out in table II. 4 cases involving hospital staff are included in the survey. It will be noted that at the beginning of the epidemic there were more admissions from Leicester city than from the county.

There was striking familial aggregation, as illustrated in table III.

Usually, 1 or 2 members only of any one household were sent to hospital by the general practitioner, who, upon confirmation of the diagnosis, treated other members at home. Some contacts had a mild illness only.

Clinical Features

Dates of onset ran continuously, suggesting dissemination by contact rather than a common source. Cases in any one household occurred at intervals of six to ten days.

The onset was acute in 90 cases, and the hour of onset could often be obtained—e.g., two lorry drivers were taken ill at the wheel, a policeman fainted on the beat, and some school-children were taken ill in class. 10 patients, however, gave a one to two weeks' history of insidious onset.

TABLE I—AGE-DISTRIBUTION

Age (years)					
1–5	6–10	11–20	21–30	31–40	41–55
13	31	14	23	14	5

TABLE II—MONTHLY DISTRIBUTION BETWEEN CITY AND COUNTY

—	July	August	Sept.	Oct.	Nov.
City	14	18	8	10	3
County	7	3	9	23	5
Total	21	21	17	33	8

TABLE III—NUMBER OF CASES IN FAMILY

Number of cases per family	Number of families
1	71
2*	13
3*	8
4*	2
5*	1
Total	95

* Including some unconfirmed cases.

Clinically the disease resembled the major illness of poliomyelitis without paralysis. The presenting symptom was usually severe headache, as I had occasion to experience. In children this was often preceded by vomiting. Table IV gives further details. There were no hallucinations, disorientation, unconsciousness, or abnormal neurological signs in any of the patients. Pyrexia varied between 99°F and 105°F (average 102°F), lasting three to five days and subsiding by lysis in 90 cases.

Illustrative Cases

(1) A man of 41. Admitted to hospital on Oct. 11. On waking up on Oct. 10 had rigors, frontal headache, which became worse, and frequent vomiting. When neck rigidity developed he was transferred to hospital. On Oct. 10 his younger daughter had similar symptoms, was treated as flu, and improved after four days. On admission: 102·5°F, pulse 84, respiration 26, alert and coöperative, no abnormality on physical examination except some neck rigidity. Lumbar puncture: 190 cells per c.mm. (78% lymphocytes); proteins 60, chlorides 620, sugar 68 mg. per 100 ml. Blood: Hb 96%, white cells 5300 per c.mm. (polymorphs 76%, lymphocytes 20%, monocytes 4%). Urine normal. Afebrile after five days. When seen on Nov. 29 he was well, no further headaches, and back to work for three weeks.

TABLE IV—SYMPTOMS AND SIGNS

Symptom	No. of cases
Pyrexia	100
Headache	100
Frontal and retro-orbital	46
Others	54
Neck rigidity	96
Back stiffness	83
Vomiting	88
Maculopapular rash	18
Rigors	18
Photophobia	15
Drowsiness	8
Abdominal pains	8
Sore throat	4
Enlarged lymph-glands	3
Constipation	Common

(2) A girl of 12, another daughter of previous patient. Admitted on Oct. 19 with twenty-four hours' history of headache, pyrexia, and vomiting. Headache was bitemporal. On admission: 101°F, pulse 112. No abnormality on physical examination, except some neck rigidity. Lumbar puncture: 48 cells per c.mm. (85% lymphocytes); biochemistry normal. Blood: Hb 82%, white cells 6000 per c.mm. (polymorphs 73%, lymphocytes 27%). Urine normal. Symptom-free and afebrile from the sixth day onwards. When seen on Dec. 6 perfectly well.

On Oct. 25 her mother felt vaguely ill and sick and had a headache. All this subsided after 2 days.

In this family of 4 people, 2 had the typical condition and 2 must be assumed to have had a mild form only. The intervals of onset were five days, eight days, and seven days respectively.

Laboratory Findings

Routine diagnostic procedure in all cases included one or more lumbar punctures, full blood-count and film, and examination of urine. Throat swabs were taken for culture, and specimens of cerebrospinal fluid (C.S.F.),

TABLE V—HÆMATOLOGICAL FINDINGS

—	Findings	No. of cases
Hb	Normal	100
White cells	Normal to slightly raised	77
	2900–4500	31
	10,000–13,000*	2
Average white count	5500	100
Neutrophils	70% or more	100

* Superinfection with streptococci present; if these 2 cases are excluded the average white count is 5380.

fæces, blood, and throat washings were taken for complete virological studies.

The blood findings are summarised in table v. No toxic changes and no abnormal cells were seen in blood-films.

A Paul-Bunnell test in a number of cases was negative. Throat swabs did not yield pathogenic organisms on culture, except for β-hæmolytic streptococci (2), *Staphylococcus aureus* (1), *Streptococcus pneumoniæ* (1), and *Hæmophilus influenzæ* (1). Urine was normal in all cases.

C.S.F. pressure was often slightly raised and lumbar puncture sometimes improved headache. No readings were taken from children. The findings are given in tables VI and VII. 3 patients with an initial C.S.F. cell-count exceeding 1000 per c.mm.

TABLE VI—ABNORMAL CEREBROSPINAL FLUIDS

—	No. of cases	
Abnormal on admission	73	
Normal on admission	27	
Changes three to four days after admission		6
No change at second lumbar puncture		6
No second lumbar puncture performed		15
Total	100	27

showed a marked reduction in cell-count three to four days later: and in 3 others the initially only slightly raised count trebled. C.S.F. chlorides and sugar were within normal limits in all cases. Bacteriological cultures of C.S.F. were sterile.

Virological Studies

Throat washings, C.S.F., and fæces from all patients were cultured for virus. Blood was taken in the acute and in the convalescent phase for serological tests. Unfortunately, a second specimen of blood was not obtained from all patients.

Virological studies on the first 30 cases were done at the Virus Reference Laboratory, Colindale, London. From 22 of these cases a cytopathogenic agent was isolated: in 19 cases from fæces, in 15 cases from C.S.F., and in 16 instances also from throat washings. Furthermore in 1 case adenovirus (A.P.C. group) was isolated, and in 1 case polio virus type I.

A positive neutralisation test was obtained with the sera of 22 patients, using the virus isolated from one of them. These viruses are similar to but not identical

TABLE VII—CHANGES IN CEREBROSPINAL FLUID

—	No. of cases	
Normal cell count	21	
Raised cell count	79	
5–100 cells per c.mm.		33
101–500 ,, ,, ,,		35
501–1000 ,, ,, ,,		6
1001–2593 ,, ,, ,,		5
		79
Lymphocytes below 35%		3
Lymphocytes 50–100%		76
		79
Proteins normal	59	
Raised proteins (all cases associated with pleocytosis)	41	
36–50 mg. per 100 ml.		20
51–100 mg. ,, ,,		13*
101–150 mg. ,, ,,		8
Average 66·3 mg. (normal 10–35)		41

* In 1 patient proteins rose to 200 mg. per 100 ml. five days after admission.

with Echo-9 virus (Boissard et al. 1957). This virus belongs to a group recently isolated from the human intestinal tract during aseptic meningitis. It has been proved distinct from poliomyelitis and Coxsackie virus (University of Buffalo 1956).

Complement fixation tests were negative for influenza A and B, psittacosis, lymphogranuloma venereum, Q fever, atypical pneumoniæ, lymphocytic choriomeningitis, and mumps, and positive in 1 case with normal C.S.F. for adenovirus (A.P.C. group).

Differential Diagnosis and Treatment

Differential diagnosis from non-paralytic poliomyelitis was difficult at the onset of the epidemic. The virus meningitis is the less severe illness, with nuchal and spinal muscle spasm of shorter duration and more rapid recovery. Familial aggregation is frequent, as opposed to its rarity in poliomyelitis. Several cases sent to hospital as non-paralytic poliomyelitis were found to be meningitis of virus origin. Some cases sent to hospital as virus meningitis proved to have a different condition—tonsillitis with meningism (5), meningococcal meningitis (1), cerebral abscess (1), neurosyphilis (2), tuberculous meningitis (2), paralytic poliomyelitis (3), cerebral thrombosis (1), and subarachnoid hæmorrhage (2). These points emphasise the importance of establishing the diagnosis by lumbar puncture in all cases presenting as meningitis.

Apart from 2 patients initially suspected of having meningococcal meningitis who had a short course of penicillin, no specific treatment was given. The common analgesics proved ineffective and had to be supplemented by pethidine. Patients were kept in bed for seven to ten days and were advised upon discharge to rest for a further week.

There was no mortality. 89 patients were well when seen as outpatients six weeks after discharge, but most of them admitted to intermittent headache (especially after exertion). Recovery was slow and tiredness and mild depression were common. There was no residual paresis, ataxia, or headache in children. 10 patients complained spontaneously of frequent headache, and 1 patient had to be readmitted to hospital eight weeks after discharge for lumbar puncture, which proved normal.

Discussion

The disease described here, which we call meningitis of virus origin (M.V.O.), presents some distinctive clinical and pathological findings: acute onset, pyrexia, and headache in all cases, signs of meningeal irritation and vomiting in most cases, rubelliform rash over face and upper extremities, sparing the trunk, and photophobia in some cases. Incidence was highest in children and young adults. On clinical evidence the present series appears homogenous, in spite of variations in C.S.F. findings; in view of the incomplete virological studies, however, there is as yet no certainty of a common ætiological factor. From 22 cases a virus akin to Echo virus type 9 was isolated, and from 1 case polio virus type I, but from 1 patient with normal C.S.F., adenovirus (A.P.C. group) was isolated. We do not know whether the normal C.S.F. in this case was coincidental.

The first isolated instances of an aseptic meningitis similar to the one described here were noted in 1955, and recently accounts appeared under various names in Britain and America. The cases described in this paper differ from those described earlier—e.g., in Nottingham meningitis (*Lancet* 1956), vertigo, and nystagmus were reported to be frequent and vomiting rare. There were no rash and no prostration, and the maximum C.S.F. cell-count was 20 lymphocytes per c.mm. Dodd's (1956) clinical and laboratory findings, however, vary from ours in detail only. Healing (1956), on the other hand, reported severe lymphocytic leucocytosis, and an

erythemato-papular rash, mainly over trunk and face, in his 2 cases.

The 125 cases of lymphocytic meningo-encephalitis reported by Lyle (1956b) were similar to our cases, in particular in C.S.F. findings. 48 of his patients, however, had acute and severe myalagia; and though only 24 had much neck stiffness, 68 had neurological abnormalities not encountered in our series. Some of Lyle's cases also had hepatitis or abnormal liver-function tests. The disease as seen by us did *not* usually conform to McAlpine's (1947) criteria of encephalitis (nystagmus, photophobia, and neck stiffness after fever and headache), as did the cases described by Lyle.

Our series bears most resemblance to 24 cases described by Karzon et al. (1956) in the U.S.A., which was called "seasonal aseptic meningitis." The causal agent isolated from Karzon's patients was Echo virus strain 6. Onset in July, household aggregation, and age-incidence were all similar to those observed here. The preponderance of males and the short duration of the epidemic described by Karzon might be accounted for by the localised outbreak in a closed community.

There is little similarity between the condition described here and the outbreak at the Royal Free Hospital in 1955.

Summary and Conclusions

100 patients suffering from an aseptic meningitis were admitted to the Leicester Isolation Hospital between July 4 and Nov. 23, 1956. The main clinical features of the disease were acute onset, headache, pyrexia, vomiting, neck and back rigidity, and occasionally a rubelliform rash and photophobia. A predominantly lymphocytic pleocytosis was found in the C.S.F. of most patients. Adenopathy was not a feature of the disease. All patients recovered without specific treatment, and with no serious sequelæ. A cytopathogenic virus related to Echo virus type 9 was isolated from fæces, C.S.F., and throat swabs in several cases. It is concluded that this essentially benign disease is probably not identical with Lyle's lymphocytic meningo-encephalitis, but shows clinical similarity with cases described by Karzon and by Dodd.

ADDENDUM

Since the present survey was concluded, more cases of M.V.O., some of increased severity, have been admitted to this hospital. Monthly incidence is on the decline.

I wish to thank Dr. J. C. H. Mackenzie, consultant and physician-superintendent, for permission to publish this paper and for his helpful criticism; Dr. N. S. Mair and Dr. H. J. Mair for help and advice on virology: and Dr. J. P. Anderson and Dr. J. R. Barton for the use of some of their case-notes.

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"... Would any one of us, taken with a grievous illness far from home, care to be nursed by a keen diagnostician, an amateur microscopist or an earnest student of pathology? What we want is a nurse who loves nursing, and the sicker we are the more we long for someone who can combine wife, sister and mother rather than an efficient technician, however well intentioned. Knowledge of sick people is gained by being with sick people and though this knowledge once acquired can be greatly enhanced by book learning, that learning itself can not be a substitute for the bedside experience. The fine arts of nursing are only unimposing to those who have never themselves been gravely ill."—Dr. JOHN ZERNY and Dr. HUMPHRY OSMOND, *Canad. med. Ass. J.* 1956, **752**, 75.

METABOLIC EFFECTS OF CARBUTAMIDE IN SELECTED DIABETICS

P. A. BASTENIE
M.D. Brussels
PROFESSOR OF CLINICAL MEDICINE

J. R. M. FRANCKSON
M.D. Brussels
ASSISTANT

R. DE MEUTTER
M.D. Brussels
ASSISTANT

T. C. DEMANET
M.D. Brussels
ASSISTANT

V. CONARD
M.D. Brussels
SENIOR ASSISTANT

From the University Department of Medicine, St. Pierre Hospital, Brussels

THE mechanism whereby certain sulphonamides exert a hypoglycæmic and (in certain diabetics) an anti-diabetic effect remains a matter of debate.

The following explanations have been suggested: inhibition or destruction of glucagon-secreting α cells (Franke and Fuchs 1955, Mellinghoff 1955, Von Holt et al. 1955, Ferner and Runge 1956); insulin-sparing action (Kinsell et al. 1956, Mohnicke 1956); inhibition of insulinase (Mirsky 1956, Mirsky et al. 1956); increased production of insulin (Gepts et al. 1955, 1956, Loubatières 1955, Ashworth and Haist 1956); depression of gluconeogenesis by a direct effect on the pituitary gland and the adrenal cortex; and increased permeability of the cells to glucose, possibly due to release of an inhibitor of hexokinase (Best 1956).

Although none of these hypotheses has been proved, in-vitro experiments have shown that hypoglycæmic drugs reduce the activity of certain enzyme systems in the liver (Clarke et al. 1956, Hawkins et al. 1956, Mohnicke and Knitsch 1956).

Many diabetics have already been treated with oral sulphonamide, but the results show that sulphonamide is no substitute for insulin and is only effective in "those subjects who possess a source of appreciable amounts of endogenous insulin" (Wrenshall and Best 1956).

Only a few clinical studies concerned with metabolic investigations have been published. We report here such studies made on diabetics treated with carbutamide ('B.Z.55').

Material

18 patients were kept in hospital for a few weeks on a 1500-calorie diet (carbohydrates 180 g., fats 50 g., and proteins 80 g.). Afterwards they were under ambulatory control with a slightly more liberal diet. Gross overweight was reduced before the start of treatment. During the treatment the patients maintained their weight. After 1–3 months' treatment the patients were readmitted for control metabolic studies.

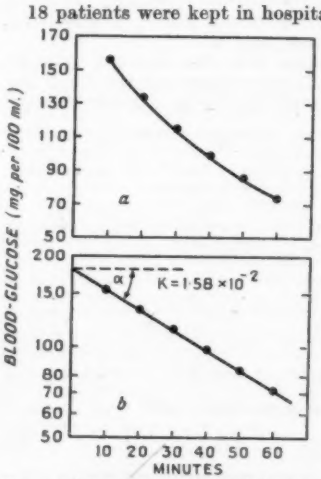

Fig. 1—Intravenous glucose-tolerance curve in healthy people: *a*, mean of observed values; *b*, semilogarithmic line derived from *a*.

16 of these patients, aged 42–82, had diabetes of the middle-age onset type; they had or

had had some obesity but never acidosis, and their diabetes never needed much insulin treatment.

Of the other 2 patients case 16 had had diabetes for twenty years, and occasionally ketosis had needed high-dosage insulin therapy; and case 18, aged 26, had mild recently discovered diabetes together with signs of adrenocortical hyperactivity (hirsuties, decreased menstruation, and increased urinary excretion of 17-ketosteroids).

Treatment

After an initial period of observation uniform treatment was given with carbutamide 4 g. on the first day, 2 g. on the second, and 1 g. daily thereafter. Occasionally, during protracted treatment, the dosage was reduced to 0·5 g. daily.

Methods

Glycosuria and glycæmia were frequently tested for by the Somogyi/Schaffer-Hartmann technique.

Before any treatment, between the 6th and the 10th days of treatment and after 1, 2, or 3 months the following studies were made:

(1) *Intravenous-glucose-tolerance Test.*—It has been shown in this laboratory that, 10–60 minutes after a rapid intravenous infusion of glucose 0·33 g. per kg. of body-weight in a 50% solution, the rate of clearance of glucose from the blood is related to its uptake by the tissues. Mathematical analysis of the blood-glucose curve yields a glucose-assimilation coefficient (Conard et al. 1953) (fig. 1). In healthy people this factor is related to age and nutrition but is constant for any given person. Its value

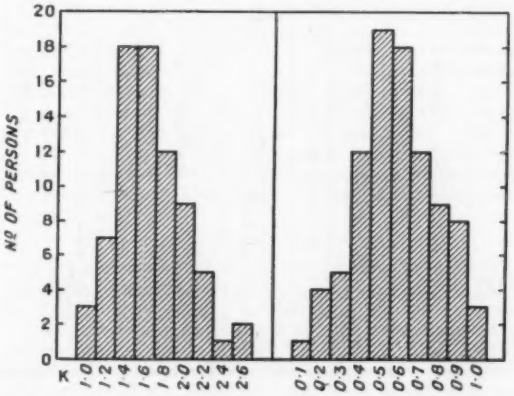

Fig. 2—Distribution curve of glucose-assimilation coefficient (K): *a*, in 75 healthy people; *b*, in 92 diabetics (Conard 1955).

ranges from 1·1 to 2·8, the mean figure calculated in 75 people being 1·8 ± 0·3. In diabetes it lies between 0·1 and 0·9 mean value 0·5 ± 0·2 (Conard 1955) (fig. 2).

(2) *Combined Intravenous Glucose and Insulin Test.*—In this test, the same procedure is used with crystalline insulin 0·1 u. per kg. of body-weight added to the intravenous glucose. The increase in the glucose-assimilation coefficient is directly related to the activity of the injected insulin (Conard 1955).

(3) *Intravenous Insulin Test.*—The intravenous injection of crystalline insulin 0·1 u. per kg. of body-weight induces a hypoglycæmic curve which, between the 5th and the 30th minutes after the injection, follows an exponential law. From these curves Franckson (1957) calculated two factors: one (*i*) corresponds to the actual hypoglycæmic effect of the hormone; the other (*a*) expresses the output of glucose by the liver (fig. 3). In healthy people factor *a* is very small

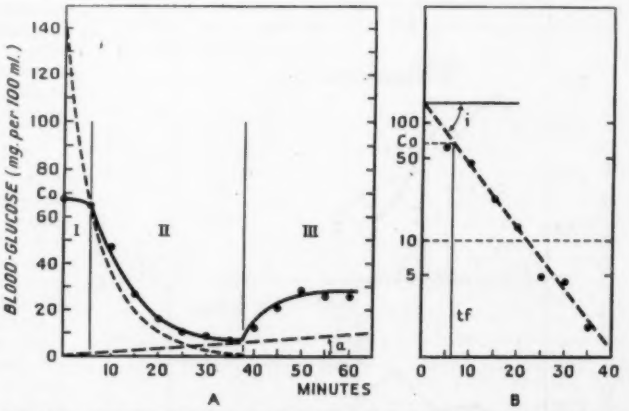

Fig. 3—A, hypoglycæmic curve in healthy person after intravenous injection of insulin 0·1 u. per kg. of body-weight; I, first period, probably corresponding to fixation of insulin in tissues (*tf*); II, second period, corresponding to progressive lowering of blood-glucose level (*Co*) (exponential curve); III, third period, characterised by secondary rebound. II corresponds either to exponential formula without residue or (as here) to exponential formula, with residue (*a*). Mathematical analysis yields this factor *a* corresponding to persisting output of glucose by liver (Franckson 1957).
B, after deduction of *a* logarithmic values of hypoglycæmic curve fall on straight line whose slope is indicated by *i*.

(0·0–0·5), indicating that, during insulin-induced hypoglycæmia, the liver's output of sugar is very small.

(4) *Blood-cholesterol and Total Lipids.*—These were estimated in some of the patients—by the method of Schoenheimer and Sperry for cholesterol and Bloor's method for the total amount of fat in the blood.

(5) *Plasma-proteins* were estimated by Van Slyke's method and separated by electrophoresis on Whatman paper no. 1.

Results

In all the cases the diabetic condition definitely improved, judged by the decrease of glycosuria, the fasting blood-sugar level, and the maintenance of body-weight. For 18 cases the mean fasting blood-glucose level was 178 mg. per 100 ml. before treatment and

TABLE I—EFFECT OF CARBUTAMIDE ON FASTING BLOOD-GLUCOSE LEVEL, MEAN VALUES OF GLUCOSE-ASSIMILATION COEFFICIENT, AND INSULIN ACTIVITY

Case no.	Mean fasting blood-glucose levels (mg. per 100 ml.)		Glucose-assimilation coefficient					
			Intravenous glucose test			Combined intravenous glucose and insulin test		
	Before therapy	During therapy	Before therapy	After treatment 6–8 days	After treatment 1–3 mos.	Before therapy	After treatment 6–8 days	After treatment 1–3 mos.
1	150	80	0·8	1·9	0·6	3·4	3·4	3·7
2	225	125	0·6	0·9	0·7	1·0	2·2	2·3
3	215	160	0·4	1·0	..	0·6	1·6	..
4	130	120	1·2	0·2	1·0	2·4	0·9	1·9
5	150	80	0·4	0·5	0·5	2·1	3·2	2·1
6	115	75	0·6	0·6	0·7	1·5	1·3	..
7	180	100	0·2	0·4	0·4	1·6	..	..
8	200	90	0·7	0·9	0·7	..	..	..
9	130	90	0·6	..	0·7	2·5	..	..
10	170	90	0·4	0·2	0·4	..	..	..
11	230	150	0·6	0·4	0·6	2·0	2·0	..
12	180	150	0·5	0·5	..	..	..	..
13	122	83	0·5	0·7	..	1·8	4·5	..
14	228	138	0·5	0·5	..	3·0	1·4	..
15	125	60	0·9	1·9	..	..	..	..
16	275	125	1·3	1·5	..	2·1	..	..
17	170	70	0·4	0·6	..	2·5	..	..
18	150	75	0·8	0·8	0·8	3·5	3·1	3·5
Mean value	175	103	0·6	0·8	0·7	2·1	2·4	2·7
Standard deviation	(46)	(31)	(0·3)	(0·5)	(0·2)	(0·8)	(1·1)	(0·8)

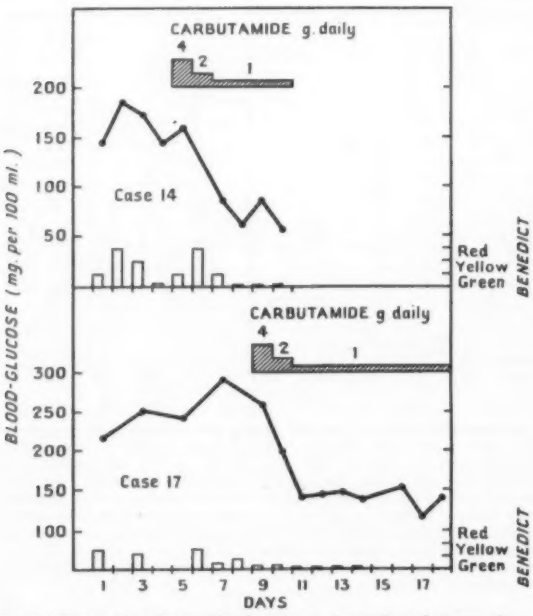

Fig. 4—Effects of sulphonamide therapy on glycæmia and glycosuria.

103 mg. per 100 ml. during treatment (table I). In case 16 the treatment was discontinued and insulin had to be given because of a surgical operation. Fig. 4 illustrates data from cases 14 and 17.

There was no change in the glucose-assimilation coefficient (table I) except a transient improvement during initial treatment in cases 1, 3, and 15. The mean values before treatment, after the first week of treatment, and after prolonged therapy were respectively 0·6, 0·8, and 0·7.

The result of the combined intravenous glucose-insulin test was not altered: 2·1 before treatment, 2·4 after initial treatment, and 2·7 after protracted treatment.

The insulin-tolerance tests showed important changes: during treatment the hypoglycæmic curves were definitely lower than before sulphonamide treatment. Fig. 5 shows the mean curves before and after initial treatment.

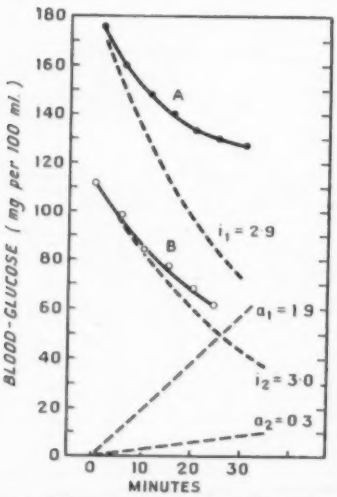

Fig. 5—Mean blood-sugar levels: A, before treatment; B, after a week's treatment. Analysis of curves shows factor *i* unchanged. High value of factor *a* before treatment was much lower after treatment.

Analysis of the individual curves (table II) indicated that, during pre-treatment observation, the insulin activity (i = 3·3) was hampered by a large output of glucose by the liver (a = 0·8–3·5, mean 1·5). During treatment the hypoglycæmic insulin effect remained unchanged (3·4 after initial treatment, and 3·5 after prolonged treatment). On the other hand, the output of glucose by the liver decreased considerably (a = 0·2 after 1 week, and 0·02 after 1–3 months' therapy). This decrease was constant in all the cases studied. In cases 6 and 10 arrest of treatment was followed by a return of factor a to its initial value.

Discussion

In sulphonamide-treated diabetics several workers have not found any sign of improved utilisation of glucose, either by studying postprandial blood-glucose levels (Wolff et al. 1956), tolerance of oral glucose (Duncan et al. 1956), or differences in blood-glucose levels between arterial and venous blood (Hunt et al. 1956, McKenzie et al. 1956).

One of the fundamental characteristics of the diabetic state is the inability of the tissues to remove blood-glucose at a normal rate (Bastenie 1956). This abnormality is shown by a decrease of the glucose-assimilation coefficient. The hypoglycæmic sulphonamides do not correct this. Duncan (1956) and Duncan et al. (1956), using a similar technique, obtained similar results. Therefore it can be concluded that, in diabetics, hypoglycæmic sulphonamides do not act by increasing the output of insulin or by either sparing or boosting the activity of pre-existent insulin. Only in 3 cases was such an effect detectable during initial treatment. The transient improvement in the uptake of glucose is probably explained by a stimulation of the β cells, such as has been observed in acute experimental studies by Loubatières (1955) and Gepts et al. (1956).

TABLE II—EFFECT OF TREATMENT ON INSULIN SENSITIVITY IN 17 DIABETICS

Case no.	Factor *i* (hypoglycæmic effect)			Factor *a* (hepatic glucose output)		
	A	B	C	A	B	C
1	4·5	3·8	2·1	1·5	0	0·2
2	3·2	2·3	4·5	2·0	0·7	0
3	2·0	2·2	..	1·5	0	..
4	1·9	3·4	2·3	1·0	0	0
5	4·3	4·7	3·5	1·2	0	0
6	3·3	3·9	1·2*	1·0	0	0·8*
7	2·4	4·0	1·8	2·2	0	0
8	2·6	2·4	..	1·5	0·5	..
9	4·9	4·6	3·2	0·8	0·7	0
10	2·8	3·3	3·9*	1·2	0	1·0*
11	1·0	2·0	4·3	1·0	0	0
12	2·4	2·6	..	1·5	0	..
13	7·5	4·6	..	1·6	0	..
14	2·5	3·3	..	3·5	0·9	..
16	3·4	3·0	..	3·0	1·5	..
17	3·5	7·2	..	0·4	0	..
18	4·2	10·0	6·3	0·4	0	0
Mean value ..	3·3	3·4	3·5	1·5	0·25	0·02
Standard deviation	(1·5)	(2·1)	(1·6)	(0·8)	(0·4)	(0·07)

A, before treatment.
B, after initial treatment (5–8 days).
C, after protracted treatment (1–3 mos.).
*Treatment stopped before test; values discarded from statistical analysis.

The most interesting observation concerns the considerable constant progressive decrease in the value of factor a.

According to Soskin and Levine (1946) a very important characteristic of the diabetic state is the absence of the normal control of gluconeogenesis in the liver. As is shown in the present investigation and confirmed in more extensive studies by Franckson (1957), during insulin-induced hypoglycæmia diabetics do not usually show the depression of the hepatic glucose output observed in healthy people. The correction of this

The hypoglycæmic effect of insulin (judged by the combined glucose-insulin test or by the value of factor i calculated from the intravenous-insulin test curves) also remained unchanged. These observations again seem to rule out a true insulin-sparing effect of the sulphonamide.

TABLE III—TOTAL NEUTRAL FATS AND CHOLESTEROL IN SERUM OF 7 DIABETICS TREATED WITH CARBUTAMIDE

Case no.	Neutral fats (mg. per 100 ml.)		Total cholesterol (mg. per 100 ml.)	
	A	B	A	B
2	1150	1025	374	245
3	980	850	317	231
5	..	1020	267	300
6	1024	760	196	213
7	1050	950	254	280
11	..	..	323	222
18	..	1150	242	236

A, before therapy. B, after therapy.

abnormality by the hypoglycæmic sulphonamide may be responsible for the lowering of the fasting blood-glucose level. This effect is best explained by the finding that hypoglycæmic sulphonamides inhibit the action of glucose-6-phosphatase (Hawkins et al. 1956). If this explanation be the true one, it means that sulphonamide treatment corrects only the end-stage of the diabetic process (i.e., the abnormal output of glucose by the liver) and not the diabetes.

In the absence of increased production or activity of insulin the gain in weight observed in sulphonamide-treated diabetics on a free diet cannot be explained by increased lipogenesis from enhanced assimilation of glucose. Decrease of glycosuria can only partly explain this gain in weight. Increase in the amount of pyruvic acid in the blood (Steigerwald et al. 1956) may point to re-utilisation in the liver of the newly formed and unexcreted glucose. More observations are needed before we can conclude, from the return of the raised blood-cholesterol level to normal (Böhle et al. 1956), that the mobilisation of lipids from the liver is decreased by sulphonamide treatment.

The blood-protein pattern, studied before treatment in 8 cases, showed, compared to the values observed in healthy people, a decrease in the percentage of albumin and a slight increase in β and γ globulins. Prolonged treatment did not much change the abnormalities, but the possibility exists that, in 3 cases, a low value of the percentage of the albumin fraction was partly corrected by the therapy. If this observation is substantiated by further studies, it points to reduced breakdown of protein and resynthesis of albumin in the liver from unexcreted glucose.

Summary

18 diabetics (all except 2 being of the obese-aged type) were given carbutamide therapy partly under well-controlled conditions. Intravenous glucose-tolerance tests, intravenous insulin tests, and combined intravenous glucose and insulin tests were made before treatment, after initial treatment, and after protracted treatment, and the levels of total lipids, cholesterol, and proteins in the serum were studied.

The results show that sulphonamide treatment induces no increased uptake of glucose by the tissues. Therefore the improvement of the diabetes cannot be ascribed to an increase of either secretion or activity of insulin.

The activity of exogenous insulin remains unchanged. Hence it may be concluded that no insulin-sparing action is demonstrable.

During insulin-induced hypoglycæmia the maintenance of a large output of glucose by the liver is characteristic of diabetes. This abnormality is corrected by sulphonamide treatment.

The action of carbutamide in diabetes is probably best explained by the discovery of Hawkins et al. (1956) that sulphonamides inhibit hepatic glucose-6-phosphatase.

Studies on the levels of cholesterol and proteins in the serum are too limited to permit conclusions. However, some observations seem to be in keeping with the idea that the unexcreted glucose may be re-utilised in the liver for the synthesis of albumin, and that less protein and less fat are katabolised.

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ACUTE SPONTANEOUS MEDIASTINAL EMPHYSEMA

S. G. FLAVELL MATTS*
M.B. Birm.
RESIDENT MEDICAL OFFICER, ROYAL DEVON AND EXETER HOSPITAL

THE term "acute spontaneous mediastinal emphysema" was first used by Hamman (1937), but Laennec (1827) described it under the name of "interlobular emphysema." Thanks largely to the experimental work of the Macklins (1944) its ætiology is now better understood. The condition, however, remains uncommon and is still imperfectly described in many textbooks.

Ætiology

PORTALS OF ENTRY OF AIR

There are five possible portals of entry of air into the mediastinum:

(1) *Through Ruptured Marginal Alveoli.*—The Macklins (1944) have shown both experimentally and by clinical correlation that, if a pressure gradient exists between the alveoli whose bases rest against bronchi, bronchioles, blood-vessels, connective-tissue septa, and pleura (the so-called "marginal" alveoli) and the structures against which they lie, rupture may take place, letting air into the underlying connective tissue, creating pulmonary interstitial emphysema. If the escape of air is considerable it will dissect the tissues along the pulmonary blood-vessels to the mediastinum. If this process continues, air accumulates in the mediastinum under ever increasing tension, interferes with the circulation by compression of the great vessels, and embarrasses the heart. This tension is relieved by the escape of air into the neck, axilla, retroperitoneal tissues, or one or both pleural cavities. The conditions which predispose to pulmonary interstitial air were classified by the Macklins (1944) into three groups: (*a*) those in which there is first an atelectasis of some part of the lung, followed by overinflation in adjoining regions in the same lung or the opposite lung; (*b*) those in which there is a decreased blood-supply to the pulmonary vessels with lowered vascular pressure, often associated with increased intra-alveolar pressure or overinflation; and (*c*) those in

* Present address: Frenchay Hospital, Bristol.

which there is a general overinflation of alveoli with or without increased intra-alveolar pressure.

(2) *Through Mucosa of Upper Respiratory Tract.*—The mucosa may be injured as a complication of endotracheal anæsthesia (Barrett and Thomas 1944, Jones 1945), trauma, or tracheostomy (Champneys 1884).

(3) *Through apical pleura* as a result of surgery or of accidental trauma (Bowden and Schweizer 1950).

(4) *Along the carotid sheath or the fascial planes of neck* as a complication of block dissection of the neck (Aiken and Smith 1953) or other neck surgery (Bowden and Schweizer 1950).

(5) *From pneumothorax*, which may be spontaneous, traumatic, or artificial (Macklin and Macklin 1944, Davidson 1951).

CLINICAL CAUSES

The following list includes all the conditions (traumatic and non-traumatic) in which mediastinal emphysema has been found or the known predisposing factors may be present (Macklin and Macklin 1944, Aisner and Franco 1949): infectious diseases (infections of upper respiratory tract, measles, tuberculosis, pertussis, pneumonia, influenza, diphtheria, smallpox, &c.), space-occupying lesions of the lungs or the mediastinum, inhaled foreign bodies, atelectasis in the newborn (due to prematurity or following the inhalation of meconium, mucous secretions, &c., before or after birth), bronchiectasis, bronchial asthma, chronic bronchitis and emphysema, parturition, violent coughing, violent exercise, acts of straining, acute obstructive laryngitis (diphtheria, streptococcal infection), playing of wind instruments, glass-blowing, &c., endotracheal anæsthesia, resuscitation by intratracheal insufflation or with a respirator, positive-pressure inhalation therapy, silicosis, pneumothorax, tracheotomy, cervical surgery, pulmonary infarction, lung blast, caisson disease, hiccup, and trauma to neck or chest.

Clinical Features

SYMPTOMS

The severity and nature of the symptoms depends on the degree of distension of the tissues and on the location and accessibility of the escape channels. In severe cases the lung, as a consequence of interstitial emphysema, may become extremely voluminous and rigid, causing orthopnœa and dyspnœa.

The commonest and most important presenting symptom is pain in the chest (Scott 1937, Miller 1945, Fagin and Schwab 1946, McCabe 1947), which is often mistaken for angina pectoris or for myocardial infarction. The onset is usually but not always sudden. It is not usually related to respiration but may be worsened by coughing. Its location is variable, the commonest sites being precordial or substernal, but it may be felt almost anywhere in the chest. It may radiate to neck, shoulders, arms, and back. The intensity varies from very mild discomfort to severe agonising pain, which may be transient or last several days and usually disappears gradually.

Other symptoms include palpitation, sweating, dysphagia, a feeling of fullness in the neck, anxiety, and crackling in the tissues. If the air has passed retroperitoneally, there may be pain in the back; if it has passed into the abdomen, there may be abdominal pain.

SIGNS

There may be very few physical signs in a mild case, and it seems likely that, for this reason, many cases of this type are not diagnosed. However, the combination of mediastinal crepitation, decrease or obliteration of cardiac dulness, subcutaneous emphysema, and pneumothorax is pathognomonic.

Air in the mediastinum produces sounds that have been described in many different ways (Fagin and Schwab 1946, Aisner and Franco 1949), the commonest terms being "crackling," "clicking," "bubbling," and "crunching." The sounds are usually most easily detected with the patient in the left lateral recumbent position and during the expiratory phase of respiration. They can be so faint as to be mistaken for a pericardial friction rub and have been shown to be related to the cardiac cycle (Hoffman et al. 1943, Fagin and Schwab 1946). The crunching sound synchronous with systole was originally described by Hamman (1937), is usually known as Hamman's sign, and is regarded as pathognomonic of air round the pericardial sac.

Pneumothorax with mediastinal emphysema is nearly always left-sided. No adequate explanation has ever been offered for this. It is present in about 60% of cases.

The subcutaneous emphysema is usually in the neck, the supraclavicular and infraclavicular fossæ, and the axillæ. Occasionally it may be found elsewhere (Adcock 1943)—in the back, the abdomen, and even the extremities—but this is rare.

The temperature and blood-pressure are usually unaffected, unless a cardiac tamponade effect occurs as a result of mediastinal obstruction, in which case the blood-pressure falls considerably. This is a sign of grave prognostic significance and indicates that steps should be taken to relieve mediastinal tension.

The respirations may be increased, particularly in the presence of pneumothorax, but the tachypnœa is usually mild.

The X-ray appearances are typical of those of air in the tissues. Air-streaks along fascial planes and pockets of air in the subcutaneous tissues are usually readily detected. It is most important to have lateral radiographs of the chest because small pockets of air either behind or in front of the heart may be otherwise missed.

There are usually no gross electrocardiographic changes. It is said that 25% of cases show positive findings (Aisner and Franco 1949), but no characteristic pattern is present. The usual abnormalities that have been described are changes in the T waves, deviation of the ST segments from the iso-electric line, and reduced voltage (Hamman 1939, Miller 1945, Fagin and Schwab 1946, Littman 1946); but pneumothorax per se may produce similar changes (Master et al. 1937, Bourne 1940).

Different Diagnosis

All other causes of either acute or subacute pain in the chest have to be excluded: angina pectoris, pericarditis, myocardial infarction, pulmonary embolism, mediastinitis, dissecting aneurysm of the aorta, pleurisy, intercostal myalgia, &c.

The chief difficulties are that the pain is very similar to that of primary cardiac disease; dyspnœa, cyanosis, and distension of the neck veins may be present; and the electrocardiographic changes may simulate an infarct (Hamman 1934, Scott 1937, Miller 1945, McCabe 1947).

However, the diagnosis is usually simplified by the following facts:

(1) Mediastinal emphysema commonly occurs in a younger age-group.

(2) There is no severe shock, fever, tachycardia, hypertension, leucocytosis, or raised erythrocyte-sedimentation rate.

(3) In most cases some or all of the typical signs of mediastinal emphysema already described are present.

Treatment

This is usually only symptomatic, the air being quickly absorbed from the tissues. However, in those cases in which increased mediastinal pressure is causing extreme respiratory or cardiac embarrassment the following methods have been suggested:

Waring (1944) advised the use of a high-pressure chamber to reduce the volume of air in the mediastinum.

Cliff (1955) suggested multiple incisions into tissues.

When a pneumothorax is present, needle aspiration of the thorax has been advised by Gumbiner and Cutler (1941) and Heald and Wilder (1949).

When a tension pneumothorax is present, thoracotomy with continuous underwater drain may prove life-saving (Aisner and Franco 1949, Borne et al. 1955).

If incision into the tissues is contemplated, the suprasternal notch is the site of choice (Gaudrault and Chalmers 1941, Aisner and Franco 1949). Karns and Daue (1948) recommend mediastinotomy in severe cases. Needle aspiration of subcutaneous emphysema has also produced symptomatic relief.

Chemotherapy is recommended in all cases, to prevent or treat respiratory infections (Schwartz et al. 1946).

Course and Complications

Mediastinal emphysema is usually benign but may become malignant under the following conditions:

(1) When local compression of the blood-vessels or of the heart interferes with the circulation.
(2) When massed air-bubbles in the pulmonic interstitial tissues splint the lungs in inspiration, making further respiration progressively difficult or impossible.
(3) When the pressure in the mediastinum rises too high owing either to blocking of the usual escape routes into the neck and retroperitoneum or to a massive escape of air into the mediastinum.
(4) When air escaping into both pleural cavities causes bilateral pneumothorax.
(5) When there is serious inflammation in the lungs.
(6) When cough or other factors create a tension pneumothorax.
(7) When the condition is a sequel to atelectasis of the newborn.

Case-reports

Case 1.—A boy, aged 4 years, started measles four days before admission. For the first two days after the appearance of the rash he was not in any way distressed. Then cough with increasing breathlessness developed, the dyspnœa becoming much more acute on the day of admission. There was no history of previous illness and no complaint of chest pain.

On examination he was breathless, ill, and slightly cyanosed, with temperature 100·8°F, respirations 60 a minute, and gross surgical emphysema all over his chest and extending into both sides of his neck and face. Moist râles were heard on both sides of his chest. No clinical evidence of pneumothorax. Radiography of his chest showed gross surgical emphysema of his chest wall, mediastinum, and both axillæ (fig. 1); consolidation in middle zone of left lung; no pneumothorax. Hb 77%.

Treatment and Progress.—Nursed in an oxygen tent and treated with sedation and full doses of tetracycline the boy steadily improved over the next week, the surgical emphysema becoming absorbed in four days, and subsequent recovery being uneventful.

Fig. 1—Case 1: gross emphysema of superior mediastinum, neck, and both axillæ.

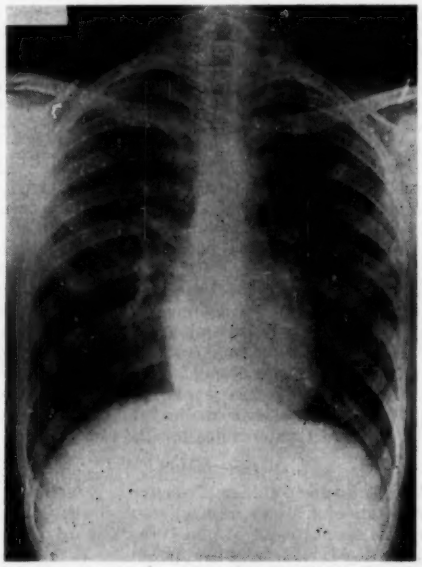

Fig. 2—Case 2: air in fascial planes of neck, mediastinum, and axillæ. Note characteristic air-streaks in superior mediastinum.

Comment.—This case would fit well into the Macklins' (1944) group *a*: atelectasis due to bronchopneumonia and overinflation due to coughing causing mediastinal emphysema. The child was severely ill on admission, his dyspnœa being due partly to bronchopneumonia and partly to interference with respiration by the mediastinal emphysema. Nevertheless the condition cleared up rapidly without specific treatment to relieve the emphysema.

Case 2.—A male bank-clerk, aged 17, had been quite well until just before admission. He swallowed a glass of fizzy lemonade and five minutes later suddenly felt a severe constricting pain in his throat, front of chest, epigastrium, and left side.

On examination he was pale and anxious but not dyspnœic, with surgical emphysema of his neck and left chest wall, a to-and-fro "pericardial rub," and no evidence of pneumothorax. Radiography of his chest showed emphysema of his neck, left axilla, and mediastinum (fig. 2); no abnormality of lung fields; no pneumothorax. After a barium swallow no abnormality was seen. Blood examination showed Hb 97%; white cells 10,000 per c.mm. (polymorphs 76%, eosinophils 6%, lymphocytes 17%, monocytes 1%).

Treatment and Progress.—A Ryle's tube was passed and left in situ for thirty-six hours. On rest in bed and penicillin therapy the boy made an uneventful recovery, the surgical emphysema resolving in ten days.

Comment.—The cause of this mediastinal emphysema is unknown. The drinking of fizzy lemonade five minutes before the onset cannot be dismissed. The patient was not ill at any time, and there was no need to consider any further treatment than that given. The friction noise heard over the precordium was recognised to be due to emphysema around the heart (Hamman's sign) but initially sounded remarkably like a pericardial friction rub.

Case 3.—A man, aged 35, had six years' history of nausea and epigastric pain. A barium meal had shown a large active ulcer on the lesser curve of his stomach and persistent deformity of the duodenal cap. The patient had not responded to medical treatment, and partial gastrectomy was advised.

Operation proceeded normally, a Polya-Hofmeister retrocolic gastrectomy being done. During the operation the emergency oxygen was accidentally turned on for about one to two minutes with the expiratory valve of the anæsthetic mask

almost closed, thus giving full pressure of oxygen in the lungs. The surgeon then found much surgical emphysema in the mesentery of the transverse colon. Most of the mesentery was emphysematous, but during the operation, which continued to proceed normally, could be felt to be rapidly resolving. The patient was taken back to the ward and made an excellent recovery. Slight surgical emphysema of the neck was detected, but this quickly resolved in one to two days. There were no signs in the chest and no evidence of pneumothorax.

Comment.—The cause of the emphysema in this case could well be the overinflation of the alveoli with increased intra-alveolar pressure—the Macklins' (1944) group *c*—due to the high oxygen pressure in the lungs during anæsthesia. The rapidity of resolution of the surgical emphysema could be due to the speed in which oxygen is normally absorbed by the tissues (considerably quicker than the nitrogen in normal air). The patient had no symptoms from his emphysema and at no time was made ill by it. The mediastinal emphysema here escaped mainly into the retroperitoneal tissues and only slightly into the neck. This case is of interest because of the unusual way in which the mediastinal emphysema arose and the unusual escape route for the air.

Discussion

Although mediastinal emphysema is a well-recognised complication of trauma to neck and chest and of neck surgery, its spontaneous or non-traumatic origin is not so widely realised. It is quite possible, in view of the multiplicity of predisposing factors and the common occurrence of some of them, that minimal examples of this condition may not be always diagnosed, and in this connection it is emphasised that a postero-anterior radiograph of the chest may not show air in front or behind the heart and great vessels. Only a lateral view can virtually exclude mediastinal emphysema, and such a view should always be taken when a patient has an unexplained chest pain.

An interesting point in the present cases is the absence of pneumothorax. Of 50 published cases (Hamman 1934, 1937, 1939, McGuire and Bean 1939, Kirshner 1939, Morey and Sosman 1939, Wolff 1940, Matthews 1941, Pinkney 1941, Styron 1941, Caldwell 1941, Miller 1941, Murphy and Zeis 1942, Griffin 1942, Meek 1942, Kellogg 1942, Dassen and Fongi 1942, Adcock 1943, Greene 1943, Lintz 1943, Munroe and Webb 1943, Hoffman et al. 1943, Israel 1943, Miller 1944, Fagin and Schwab 1946, Schwartz et al. 1946, Cliff 1955) 30 had a left-sided pneumothorax. The coexistence of a pneumothorax seems to make the prognosis worse, although in most of the published cases the pneumothorax was small.

The term "spontaneous" was originally used because no cause was known. Nowadays, however, a predisposing cause can be found in most cases, but occasionally (as in case 2) there is no obvious cause. The term "spontaneous," however, should be retained to denote that the condition is not due to trauma.

Summary

Three cases of non-traumatic mediastinal emphysema are reported because of their relatively mild nature, minimal physical signs (in two cases), ætiology, and rapid recovery.

Two of the cases could be assigned to known causes, but the cause of the third is unknown.

I wish to thank Dr. F. S. W. Brimblecombe and Dr. C. J. Fuller for advice and encouragement, Dr. A. J. Daly, Mr. K. P. S. Caldwell, and Dr. W. J. Walter for permission to publish case-reports, Mr. R. Dyson for photographs, and the librarian of the B.M.A. library for help with the literature.

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SYMMETRICAL PERIPHERAL GANGRENE AS A TOXIC REACTION TO SULPHAMEZATHINE AND PENICILLIN

J. M. BARBER
M.D. Belf., M.R.C.P.E.
CONSULTING PHYSICIAN, NORTH DOWN HOSPITALS

Y. A. MACILWAINE
M.D. Belf.
PATHOLOGIST, ARDS HOSPITAL, NEWTOWNARDS, CO. DOWN

VERY many toxic reactions to sulphonamides and to penicillin have been described, but symmetrical gangrene appears to be extremely rare.

A boy, aged 12 years, was admitted on Feb. 20, 1956. There was nothing significant in the family history, in particular no history of allergy. He had had measles, mumps, and chickenpox. Two weeks before admission he developed otitis media. This was treated with sulphadimidine 2 g. initially followed by 1 g. four-hourly for seven days. His ear responded satisfactorily, but at the end of the week he had painless hæmaturia. Penicillin was substituted for the sulphadimidine. Four days later the tips of the boy's ears, the end of his nose, and the tips of all his fingers and toes were cyanosed and became gradually worse. Penicillin was withheld, and he was admitted to hospital.

On admission he was not distressed. His temperature was 99·4°F. He had incipient gangrene of the tips of all his fingers and, to a much less degree, his toes. The digits, the lobes of his ears, and the extreme tip of his nose were blue and cold. He had gross hæmaturia. There were no abnormal physical signs in heart, lungs, abdomen, and central nervous system.

Investigations.—Hb 9·2 g. per 100 ml.; red cells 3,300,000 per c.mm.; packed-cell volume 31%; mean corpuscular volume 95 c.μ; mean corpuscular Hb concentration 31%; white cells 15,600 per c.mm. (neutrophils 79%, eosinophils 3%, monocytes 2%, lymphocytes 16%). There was nothing abnormal in the blood-films. The serum-bilirubin was normal. The blood-urea was 60 mg. per 100 ml. The Wassermann

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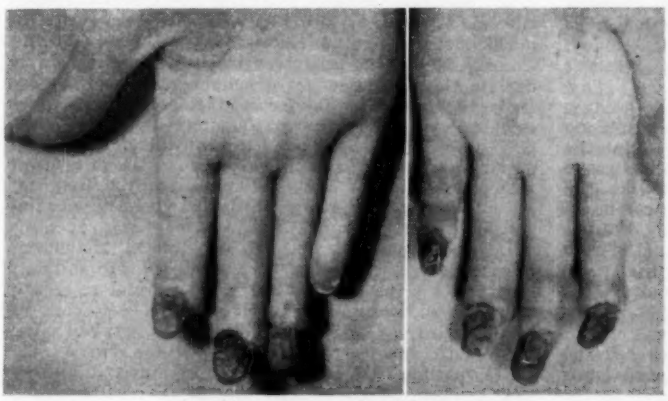

Sloughing gangrenous tips of fingers.

and Kahn reactions were negative. The Donath-Landsteiner reaction was negative. The serum-electrolyte levels were within normal limits. The urine was loaded with red cells and contained granular casts and albumin. Cold agglutination tests on the blood were within normal limits.

Treatment and Progress.—Tolazoline hydrochloride was given intravenously and later intramuscularly without effect. Cortisone acetate was also used without producing any improvement. The child's general condition remained good. He had no pain in his fingers. His renal condition slowly improved: blood, albumin, and casts disappeared from his urine, and the blood-urea level returned to normal. Radiography of his chest showed nothing unusual. His toes, the lobes of his ears, and the tip of his nose became normal in the second week. His left thumb also resolved completely, but the ends of his other digits became gangrenous and sloughed (see figure). Renal-function tests were normal before discharge, after eleven weeks in hospital.

Follow-up.—When seen ten months after his initial admission the boy was back at school, and had remarkably little disability. He had lost the tips of all his digits except the left thumb, but the stumps had healed well, and he could use them normally. The fact that the left thumb was spared considerably lessened the resulting disability.

This case is regarded as one of arterial damage due to sensitivity to sulphadimidine. Schmid (1953) described a case in an adult with peripheral symmetrical gangrene of this type but rather more severe, which he attributed to sensitivity to a sulphonamide and penicillin. In the present case the boy did not have penicillin until after hæmaturia was observed, and the peripheral gangrene followed in four days. Hence it seems likely that the damage was done before penicillin was given.

My thanks are due to Mr. J. MacGouran, M.S.R., for the photographs.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Effects of Smoking

THE section of medicine met on Feb. 26, with Dr. G. E. BEAUMONT, the president, in the chair, to discuss the physiological and medical effects of smoking.

Prof. J. H. BURN, F.R.S. (Oxford), described experiments (many of them carried out in his laboratory) on the cardiovascular effects of nicotine. He first referred to the statements made about the amount of nicotine yielded by cigarettes, and said that Ling and Wynn Parry had found that the smoke entering the mouth from one cigarette contained not more than 1·0 mg., while the amount absorbed when inhaling was about 0·3 mg.

Smoking, by sympathetic stimulation through the stellate ganglion and the production of adrenaline, increased the heart-rate and raised the blood-pressure by about 10–20 mm. Hg (more in hypertensive patients). It caused vasoconstriction in the skin, shown by a diminution of blood-flow in the warm hand on plethysmography. That this action was peripheral, and not entirely ganglionic, had been shown by perfusing the denervated ear of a rabbit through a cannula in the artery and measuring the venous outflow. Even in the absence of ganglia, the vasoconstrictor effect was blocked by hexamethonium and reversed by tolazoline. The effect might be due to release of adrenaline or noradrenaline from local chromaffin tissue, which would account for the ill effects of smoking in thrombo-angiitis even after sympathectomy.

The direct effect of nicotine on the coronary arteries was to dilate them, but the constriction caused by vasopressin (through nicotine's stimulation of the supraoptic nucleus) might outweigh this effect. Vasopressin had been recovered from the urine after cigarette smoking. Nicotine might directly affect the myocardium, which contained noradrenaline and possibly chromaffin tissue. After smoking, the T wave of the electrocardiogram was flattened; there were changes in the ballistocardiogram only in patients with coronary-artery disease. Ectopic rhythms were sometimes caused. Filter-tips did not abolish these effects. Some tolerance to the antidiuretic effect of nicotine might be seen in smokers, but as we grew older we might lose our power to metabolise nicotine. Nicotine stimulated peristalsis; the mechanism was not clear.

Dr. RICHARD DOLL said that 20 retrospective studies had shown a significant association between smoking cigarettes and lung cancer. The association held only for oat-cell, squamous-cell, and undifferentiated carcinomas, and not for adenocarcinomas. Two prospective studies were now in progress. Among British doctors questioned in 1951 as to their smoking habits, early results had shown sharp differences in the death-rate from lung cancer; the incidence was low in non-smokers but increased as the number of cigarettes smoked increased. The association with pipe smoking was less striking. Similar trends, though much less marked, were seen in the death-rates from coronary thrombosis, and from other respiratory diseases, where the trend was chiefly due to an association with bronchitis. Other types of cancer and other diseases showed no trend in either direction. Smokers who had given up smoking had a lower mortality from lung cancer than those who had not. A similar study was being made in the United States by Hammond and Horn on 200,000 men. The results so far reported indicated that the death-rate from lung cancer was ten times as great in cigarette-smokers as in non-smokers.

Dr. Doll discussed and dismissed possible causes of bias. It had been suggested that the diagnosis of lung cancer was made more often in smokers; but if only histologically proven cases were accepted, the association with smoking was even greater than in the whole series. An effect due to selection of an unrepresentative sample of men, because of a tendency of non-smokers to reply more readily than heavy smokers to questions about smoking habits, would be expected to apply to all diseases, and the effect would wear off in time, whereas the trend had been about the same in each year of the British investigation and was becoming greater in the

American investigation. It was unlikely that smoking merely determined the site of a cancer which would have developed elsewhere if the patient had not smoked, because there was no reduction in the incidence of cancer at other sites in heavy smokers.

Another suggestion was that the results arose because heavy smoking was commoner in cities—i.e., among those more exposed to atmospheric pollution. But the figures showed that, so far as British doctors were concerned, heavy smoking was in fact as common in the country as in the city, and non-smoking as uncommon; thus atmospheric pollution was not the factor. Another suggested factor was alcohol, since heavy drinkers were often heavy smokers; but it had been shown that there was no significant difference in the prevalence of lung cancer between drinkers and abstainers if smoking habits were kept constant.

The mortality-rate from lung cancer had risen with the consumption of cigarettes, but about twenty years later. Cigarette consumption in this country had been relatively constant since 1946, and the annual increase in the number of deaths from lung cancer might be expected to cease in the course of the next one or two decades. There was in general a good correlation between the death-rate from lung cancer and the cigarette consumption in different countries, though the death-rate was higher in Britain and lower in the United States than would be expected from comparison with other countries.

Hyperplasia and metaplasia of the bronchial epithelium had been shown to be commoner in smokers than in non-smokers, and 3:4 benzpyrene (which has been found in tobacco tar) had produced similar changes in human fœtal lung in tissue-culture.

Dr. NEVILLE OSWALD looked at the question from a clinician's point of view. He said that smoking often made angina worse and always made thrombo-angiitis worse. Swallowing excessive tracheal secretion might explain the adverse effect of smoking on peptic ulcer. He wondered whether there was a threshold beyond which smoking caused lung cancer. A study of Civil Servants had shown only a slight trend towards a higher incidence of mild respiratory symptoms or bronchitis in smokers than in non-smokers. Many patients seen at the Brompton Hospital on account of bronchitis had given up smoking and felt better for it.

In the discussion, Dr. W. C. BOAKE (Melbourne) reported an investigation of a group of 118 ordinary adults in Cleveland, Ohio, for whom careful records of common acute respiratory illnesses had been kept for up to six years. There was no correlation between smoking and the incidence or severity of these illnesses. Of the symptoms, he confirmed the common impression that smokers coughed more, though they had no more sputum. They had fewer sore throats—perhaps because they had one all the time and did not notice them. Mr. F. A. WILLIAMSON-NOBLE said that the carbon monoxide produced by smoking appreciably increased the oxygen need of aviators. Dr. HORACE JOULES pointed out that effective legislation about chimney-sweep's cancer did not come till a hundred years after the discovery of its cause, and predicted a million deaths from lung cancer in this century in England and Wales unless people stopped smoking.

The PRESIDENT observed that 15 of the audience had been smoking at the start of the discussion, but only 1 at the end.

Ætiology of Pre-eclampsia

A MEETING of the section of obstetrics and gynæcology on Feb. 22, with the president, Mr. ALAN BREWS, in the chair, discussed the causes of pre-eclampsia.

Prof. J. C. MCCLURE BROWNE said there were as many theories on this subject as there were obstetricians. Eight or nine years ago the work of Beker [1] and Bastiaanse and Mastboom [2] had revived interest in the placenta as the supposed starting-point of the chain of events which culminated in eclampsia. If placental ischæmia could indeed cause a rise in systemic blood-pressure, it was logical to suppose that pre-eclamptic toxæmia would develop when the pregnant uterus was overdistended, as in hydramnios and twins, and sometimes in the primigravida. Professor Franklin and Mr. Sophian had shown that distension of the pregnant rabbit uterus would cause a renal cortical ischæmia, which could be held to account for the albuminuria and so on. But McGaughey and his colleagues [3] had lately failed to demonstrate a specific uterorenal reflex in the dog.

Up till 1948, no-one had shown that placental ischæmia existed in pre-eclampsia, and Professor Browne described experiments which he and his colleagues performed to decide this point. When the placenta was situated anteriorly it was possible to inject a tracer dose of ^{24}Na into the choriodecidual space and to record the time taken for it to be cleared by the maternal placental circulation. In a normal woman between 38 and 40 weeks the mean half-period for clearance was 21 seconds; in pre-eclampsia it was 65 seconds. In essential hypertension, however, where the hypertension has antedated the pregnancy, the same degree of ischæmia was found. It was concluded, therefore, that the placental ischæmia was the result and not the cause of the hypertension of pre-eclamptic toxæmia. We were astounded, Professor Browne declared, at the big reduction in maternal placental blood-flow when hypertension was present, but careful rescrutiny of the methods and results had confirmed the findings.

The clear evidence that hypertension causes placental ischæmia, and not the other way round, suggested that the uterine-tension theory of pre-eclampsia was wrong. The exponents of this theory held that the tension of the primigravid uterus, or the presence of twins or hydramnios, produced placental ischæmia and if the intra-uterine tension was reduced (e.g., by rupturing the membranes), then the ischæmia was diminished and the toxæmia immediately improved. But this was certainly not Professor Browne's experience in clinical obstetrics; there were many instances of serious deterioration after surgical induction in pre-eclamptic toxæmia.

Dr. NORMAN MORRIS said that Professor Browne's pioneer work had stimulated Dr. Payling Wright and himself [4] to investigate the clearance-rate of ^{24}Na from the myometrium. 0·3–0·4 ml. of ^{24}Na Cl, with an activity of between 5 and 10 microcuries, was injected into the myometrium. A Geiger counter was then arranged over the site of injection and the rate of clearance of the ^{24}Na was recorded. Normotensive women gave an average time to half value of 4·1 min. In mild pre-eclampsia (diastolic pressure 85–95 mm. Hg) the average was 7·7 min.; and in severe pre-eclampsia (diastolic over 95) it was 15·3 min. These figures strongly suggested that pre-eclampsia was associated with a significant reduction in myometrial blood-flow and that this was probably the main cause of the reduced placental blood-flow observed by Professor Browne. Further observations showed how the clearance-rate seemed to be progressively reduced as the blood-pressure rose. Lowering the blood-pressure with protoveratrine improved the clearance-rate. Experiments were then designed to determine the effect of exercise upon the clearance-rate of ^{24}Na both from the myometrium and from the anterior

1. Beker, J. C. *J. Obstet. Gynæc., Brit. Emp.* 1948, **55**, 756.
2. Bastiaanse, M. A. von B., Mastboom, J. L. *Ned. Tijdschr. Geneesk.* 1949, **93**, 2609.
3. McGaughey, H. S., Weller, H., Anslow, W. P. *Amer. J. Obstet. Gynec.* 1956, **72**, 589.
4. Morris, N., et al. *Lancet*, 1955, **i**, 323; *Ibid*, 1956, **ii**, 481.

belly of the quadriceps. The results suggested that during exercise blood-flow to the uterus was reduced but quickly returned to normal when the exercise stopped. This reduction in uterine flow was probably the result of a generalised splanchnic vasoconstriction, since, in the non-pregnant, exercise also reduced the renal blood-flow.

Turning to the clinical significance of these findings, Dr. Morris pointed out that in pre-eclampsia it was well established that rest usually prevented deterioration while physical activity caused exacerbation. Reduction of salt intake was also beneficial, though the reasons for this were not clear. The precise origin of the pressor mechanism was also unknown. Mr. Sophian thought it originated largely from the kidney; others thought it came from the placenta; still others believed that it might arise in the adrenal or pituitary. The harmful effect of exercise strongly suggested that the increased splanchnic vasoconstriction that resulted in some way also further stimulated and perpetuated the production or activity of the pressor factor, thus establishing a vicious cycle. Many women progressed to moderate or even severe pre-eclampsia before they were seen. Dr. Morris wondered what would happen if all primigravidæ over 30 weeks were treated as though they already had mild pre-eclampsia: might not then the pattern of severity of pre-eclampsia be much changed?

Dr. Morris found it hard to accept that pre-eclampsia was primarily due to myometrial resistance to stretch or to a uterorenal reflex. Pre-eclampsia was certainly *not* associated with a consistently increased intra-uterine pressure. If the stretch theory was right, why was it that twins, acute hydramnios, and pregnancy in a rudimentary horn did not always give rise to pre-eclampsia? Furthermore why could pre-eclampsia occur in association with an extra-uterine pregnancy?

Mr. JOHN SOPHIAN'S theme was cortical renal ischæmia and the stimulus that provoked it—the uterorenal reflex initiated by stretching of the resisting uterine muscle. Discussing renal hæmodynamics, he said that it had hitherto been held that there was a uniform single circulation in the kidney and that the regulation of glomerular filtration depended on the ratio of afferent to efferent arteriolar resistance. But Pappenheimer had lately emphasised the fact that, since the afferent arteriole was shorter and at least 50% wider than the efferent, its effective resistance must be small compared with the efferent resistance. Pappenheimer had also disproved the explanation of extraction-ratio values put forward by the Homer Smith school; and his observations provided a new and accurate yardstick for determining hitherto occult changes in renal circulation—changes responsible for the ischæmia which, in Mr. Sophian's view, underlay the pre-eclamptic process. To explain renal hæmodynamics, two intrarenal circulatory processes must be envisaged: one offered a greater resistance to blood-flow than the other, and it was not very efficient in extracting circulating substances and consequently had a smaller oxygen need. Pappenheimer's two circulations were in parallel, whereas the Trueta dual circulation was in series; but there were many points of similarity between the two. This idea of a dual intrarenal circulation immediately shed new light on pre-eclampsia: according to this thesis, ischæmic and anoxic changes were occurring occultly in the kidney—changes that explained the œdema, albuminuria, and hypertension of pre-eclampsia.

Turning to the part played by the uterus in initiating the renal changes, Mr. Sophian said he had no doubt that myometrial resistance to stretch explained the events. Dysmenorrhœa, uterine inertia, and pre-eclampsia seemed to arise preponderantly in women whose cervix has not been stretched by a full time-fœtus—suggesting that an intact cervical innervation had a share in their production. This innervation might be responsible for keeping up isometric tension in first pregnancies and thereby adding to the resistance to stretch. Proof of this increased tension was partly derived from biochemical studies and partly from tocometric tracings. Moreover, Reynolds had pointed out that whereas the multiparous uterus tended to become globular after mid-pregnancy, the primigravid organ became elongated, connoting a rise of tension. He had also shown the existence of such heightened tension in toxæmia. Increase in circulating adenosine in toxæmia was shown to indicate both uterine muscle ischæmia and an increased isometric tension of the muscle.

In addition to the histological proof of the uterorenal reflex, biochemical evidence had lately been provided by McGaughey et al.,[3] who had shown that a mean reduction of 23% in the urinary clearance of *p*-aminohippuric acid followed acute distension of the uterus in dogs—a clear indication of reduced renal plasma flow induced by the reflex.

The reduced circulation observed in the uterus of pre-eclampsia was due in the first place to the resisting tension in its walls and later (and additionally) to the constriction of its vessels provoked by the pressor substances from the ischæmic kidney, which also responded similarly to exercise, as Dr. Morris had indicated. As for the effects of treatment, release of liquor relieved uterine tension, the uterorenal reflex subsided, and the toxæmia abated. Similarly, the death of the fœtus relieved the toxæmia because the resulting flaccidity of the fœtus and the reduction in the turgescence of the myometrial circulation lessened both stretch influences and uterine tone, and thus improved the mother's condition.

Mr. Sophian discounted the rôle of the placenta because (*a*) toxæmia could recur during labour, days after its quiescence on the death of the fœtus, and (*b*) hormones were not of primary ætiological significance.[5] These facts disproved toxin production and abnormal hormonal action by the placenta. There was further proof of this: although the interstitial-fluid space was 40% larger in the toxæmic than in the healthily pregnant woman, this space in the fœtuses of both toxæmic and normal mothers showed no expansion. Yet there was evidence, in the mastitis of the newborn males, that maternal œstrogen passed the placental barrier.

Reviews of Books

Experimental Design and its Statistical Basis

D. J. FINNEY, M.A., SC.D., F.R.S., reader in statistics in the University of Aberdeen. London: Cambridge University Press. 1955. Pp. 169. 30*s*.

ALTHOUGH his early experience in the development of experimental design lay in the field of agriculture, Dr. Finney has written an excellent introduction to the tactics of experimentation for scientists in general which should be valuable to medical research-workers in particular.

The mathematical background is minimal, but the rationale of the science of experimental design in the Fisherian tradition is clearly set out. The compact style requires close attention, but the reader will be rewarded by a clear understanding of the notions underlying such experimental designs as randomised blocks and Latin squares. The relevance of these simpler designs to medicine is made obvious by some well-chosen examples of clinical trials and tests of experimental or observer variation. Experimentation in genetics and the more complex designs involving confounding are briefly covered. A chapter on sequential experiments, including an outline of "staircase methods" in bio-assay, should stimulate pharmacologists to reconsider their plans for laboratory assessments of therapeutic agents.

This text can be confidently chosen by the medical scientist as a primer in the experimental method.

5. Sophian, J. *Amer. J. Obstet. Gynec.* 1956, **72**, 693.

Marshall's Physiology of Reproduction

3rd ed. Vol. 1, part 1. Edited by A. S. PARKES, D.SC., SC.D., F.R.S., National Institute for Medical Research, London. London: Longmans, Green. 1956. Pp. 688. 150*s*.

THE second volume of the new edition of this enormous and useful book has already appeared. The first volume has itself undergone fission.

Part 1 contains, in addition to Marshall's own original first chapter, chapters on the morphology and anatomy, reproductive cycle, œstrous cycle, ovarian changes, and changes in the non-pregnant female adnexa, throughout the vertebrates. The matter is presented phylogenetically in each chapter, and there is little overlapping between the morphological and physiological accounts. The material reviewed is drawn mainly from publications before 1948. The time-lag is unfortunate, but not excessive in view of the size of the task and the fact that all the contributors are active in research. A 4th edition is already in preparation.

The "perennial controversy" about the neogenesis of ova in adult mammals, which has been conducted for so long between Dr. Parkes on the one hand and Sir Solly Zuckerman, his leading contributor, on the other, is nicely but rather briefly reviewed by Dr. F. W. R. Brambell in the chapter on ovarian changes.

The merits of this book as a source for all biological workers are already recognised, and in the new edition they are if anything increased. Human reproduction is treated in its strictly comparative context, but the book ought to be consulted regularly by any medical worker who attempts to supplement his understanding of human physiology by experiments on animals. Perhaps the chief merit of such extended reviews is that they hammer home the diversity of animal physiology and the dangers and profits of analogy—both are important in medicine, if we remember the long period of obstruction in endocrinology which resulted from the confusion between œstrous and menstrual cycles, and which Marshall himself did much to end. The corresponding defect of large reviews is that they tend to perpetuate error by diverting inquirers from the original papers; but the choice of contributors to this book and the excellent bibliographies reduce this risk. Even at the cost of further increase in size and price, a growing need becomes evident for the inclusion of a parallel treatment of reproductive behaviour. The new volume is expensive but indispensable to those who deal with its subject-matter.

Chirurgie orthopédique des paralysies

R. MERLE D'AUBIGNÉ, professeur de clinique chirurgicale orthopédique et réparatrice à la Faculté de Médecine de Paris; J. BÉNASSY and J. O. RAMADIER, chirurgien-assistants des Hôpitaux de Paris. Paris: Masson. 1956. Pp. 430. 4200 fr.

THIS is the first volume of the *Collection de Chirurgie Orthopédique* planned by that good friend of this country, Prof. Merle d'Aubigné, and if the standard of this book can be maintained the subsequent fourteen volumes can be sure of a warm welcome. The book is directed towards the young surgeon who wants to know not just what could be done but rather what should be done for any particular condition. It is essentially concerned with treatment, each chapter dealing with the mechanical and dynamic aspect of its subject. All standard procedures are fairly assessed. Poliomyelitic paralyses are not included as they are to be the subject of a separate volume. This well-balanced book will prove most useful to the surgeon confronted with these often difficult exercises in surgical judgment.

Lectures in Immunochemistry

MICHAEL HEIDELBERGER, PH.D., emeritus professor of immunochemistry, College of Physicians and Surgeons, Columbia University, New York. New York: Academic Press. London: Academic Books. 1956. Pp. 150. 32*s*.

THIS is a collection of lectures delivered during the past ten years in Tokyo, Paris, Marburg, and New Brunswick.

The topics range from general aspects of immunity to quantitative analytical methods of serology. The lectures are reproduced as they were delivered, and they have not been edited to weld them into a coördinated whole. Characteristically Heidelberger remarks: "this small volume is an indolent man's response to the urging of his friends that he write a book." All serious students of immunity will welcome these discussions of subjects with which the author has been familiar so long. Heidelberger's interest in immunology began with coöperation with O. T. Avery in studying the specific polysaccharides of pneumococci, extended to the development of quantitative analytical methods in serology, and included searching studies of complement, whose functions in immunity reactions are still something of a mystery.

Neoplasms of the Domesticated Mammals

E. COTCHIN, M.R.C.V.S., department of pathology, Royal Veterinary College, London. Review series no. 4 of the Commonwealth Bureau of Animal Health, Farnham Royal, Bucks. 1956. Pp. 100. 20*s*.

VETERINARY surgeons have not, in the past, been greatly interested in pathology. Recently, however, a new enthusiasm for this subject has arisen in teaching schools.

The purpose of this book is threefold: to interest veterinary surgeons and pathologists in the subject; to encourage the study of material which, as Prof. R. A. Willis pointed out in 1948, is largely wasted; and to provide a background of knowledge (including references to published work) about tumours in animals for the use of experimentalists, who often have to decide whether a certain neoplasm has been induced by the treatment employed.

The scope of the book is limited to tumours in the horse, ox, sheep, pig, dog, and cat. A series of 930 spontaneous tumours in rabbits, guineapigs, rats, and mice has recently been reviewed by C. Tamaschke (*Strahlentherapie*, 1955, **96**, 150). Each of the 1000 works listed in the bibliography has been seen by the author, who adopts a reasonably critical attitude to incomplete or misleading descriptions—which must have been very difficult in a field where "Many of the papers consulted were of a rather anecdotal nature."

The nomenclature, based on that proposed by R. A. Willis (*Pathology of Tumours*. London, 1948) for human tumours, is simple and comprehensive. The tumours of each system are considered in paragraphs relating to the various species one by one. This method tends rather to break the sequence of the text but is useful for reference to the facts about a particular species. The bibliography is good, and there is an index.

This book will be a valued addition to pathological reference libraries, and it will be hailed with gratitude by all experimentalists whose field in any way touches neoplastic diseases.

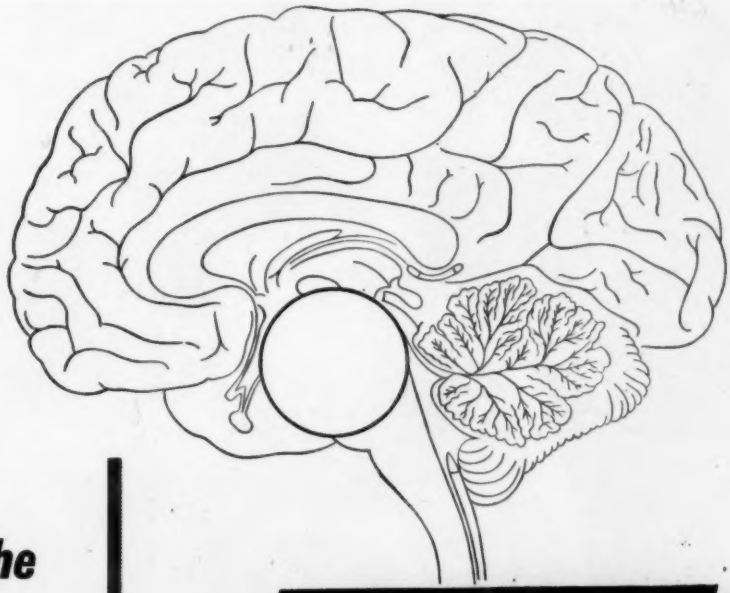
Classics in Arterial Hypertension

ARTHUR RUSKIN, M.D., F.A.C.P., associate professor of internal medicine, University of Texas Medical Branch, consultant to the U.S. Public Health Service Hospital, Galveston, Texas. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956. Pp. 358. 72*s*.

THIS compilation will be of great interest to all physicians with a scholarly interest in the unsolved problems of hypertension in our ageing population.

Workers quoted range from Stephen Hales to Harry Goldblatt, and include 19th-century British contributions by Bright, Johnson, Gull, Sutton, Gowers, Albutt, and Mahomed. Writings of Korotkoff, Riva-Rocci, Tigerstedt, and many others are included. While many will welcome the opportunity to read the *ipsissima verba* (even in translation), some may be surprised at the lack of balance between the selections and the omissions. Mahomed's paper on scarlatinal nephritis, written at the age of 25, is given at length, while his later and more interesting paper dealing with essential hypertension is left out. Volhard and Fahr get short mention but are not quoted. Potain's work on hypertension is sketched but the extract from his paper on gallop-rhythm, admittedly of great excellence, is rather outside the main theme.

Dr. Ruskin has produced an appetiser. We hope that he or a colleague will later provide a greater variety of morsels.



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Hypophysectomy for Cancer

HYPOPHYSECTOMY was first described for breast cancer in 1952–53,[1 2] not long after HUGGINS and BERGENSTAL[3] had established total adrenalectomy as a practical procedure in 1951. Adequate data are now beginning to accumulate so that the relative value of the two operations can be assessed. Hypophysectomy has several theoretical advantages over adrenalectomy. By removing the gonadotrophic and adrenocorticotrophic stimuli, it might be expected to eliminate œstrogens from the body more completely than is possible by combined oöphorectomy and adrenalectomy. Œstrogens and pregnanediol have been found in the urine even after oöphorectomy and adrenalectomy,[4 5] which suggests that accessory adrenal or other œstrogen-secreting tissue may be left behind; and accessory adrenal tissue has in fact been demonstrated in the region of the cœliac artery [6] and in the broad ligament.[7] On the other hand, STRONG et al.[5] did not detect any increase in the output of œstrogens and pregnanediol in patients who had undergone oöphorectomy and adrenalectomy and were then given an intravenous infusion of corticotrophin. Actually, even hypophysectomy does not necessarily eliminate œstrogens from the urine [4]; but the elimination of prolactin may be of equal importance [8 9]; and the elimination of growth hormone might be a further advantage of hypophysectomy for breast cancer. Growth hormone is known to increase the incidence of certain tumours in rats, whereas hypophysectomy reduces it.[10 11] This influence of growth hormone has been observed in a patient with breast cancer who was in a state of remission after bilateral oöphorectomy and adrenalectomy, followed by hypophysectomy: injections of growth hormone for 18 days led to a steady increase in urinary calcium and phosphate excretion, in the same ratio as that of calcium to phosphate in bone, suggesting that the growth hormone had induced bone destruction by stimulating the growth of bone metastases.[12–14] Another reason for the trial of hypophysectomy in the treatment of malignant disease is that only 13 instances have been reported of cancer in association with panhypopituitarism, and in none of these did the growth arise in the breast or ovary.[15] The only theoretical objection to hypophysectomy is that cancer of the female breast and genital tract occurs more often in hypothyroidism than in hyperthyroidism and that after partial thyroidectomy a greater proportion of women between the ages of 40 and 60 have breast or genital cancer than in the average population of the same age.[16] Likewise, in laboratory animals, thyroid deficiency sometimes permits a more florid growth of the breast.[17]

Benefit from hypophysectomy has so far been largely confined to patients with carcinoma of the breast. Most of the reports have come from LUFT and OLIVECRONA and their colleagues in Stockholm [18] and from PEARSON and RAY and their associates at the Sloan-Kettering Institute, New York.[12–14] A preliminary report from the Royal Free Hospital, London, has lately appeared [19] and this week we publish details about what is probably the largest series from this country, studied by Mr. ATKINS and his colleagues at Guy's Hospital. LUFT et al.[18] noted objective remissions after hypophysectomy in 22 (54%) out of 41 patients with breast cancer in whom accurate assessment was feasible (that is to say, shrinkage of visible, palpable, or radiological metastases, or increased bone density without progression of the old metastases or appearance of new ones); some of the remaining patients had only temporary symptomatic improvement. A similar remission-rate (56%) was achieved in other reported cases, compared with 45% after total adrenalectomy and oöphorectomy. The duration of remission in LUFT et al.'s patients had so far averaged 17 months (only 1 out of 14 was still in remission after 2 years), compared with an average of 9 months after adrenalectomy and oöphorectomy. They do not, however, feel justified as yet in regarding this difference as conclusive. PEARSON et al.[13] recorded subjective remissions after hypophysectomy in 21 (51%) out of 41 cases, and the average remission to date was 6·5 months. KENNEDY [20] claims objective remissions in 18 (64%) out of 28 patients lasting an average of 7·6 months, with regression of the primary growth, recalcification of the osteolytic lesions, shrinkage of the lymph-nodes and pulmonary and hepatic metastases, and disappearance of skin nodules. The Guy's team are the first to compare the results of hypophysectomy and adrenalectomy within their own experience. Their findings suggest that the over-

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2. Luft, R., Olivecrona, H. *J. Neurosurg.* 1953, **10**, 301; see leading article, *Lancet*, 1956, i, 676.
3. Huggins, C., Bergenstal, D. M. *J. Amer. med. Ass.* 1951, **147**, 101.
4. Bulbrook, R. D., Greenwood, F. C. 53rd annual report of the Imperial Cancer Research Fund. London, 1956; p. 13.
5. Strong, J. A., Brown, J. B., Bruce, J., Douglas, M., Klopper, A. I., Loraine, J. A. *Lancet*, 1956, ii, 955.
6. Graham, L. S. *Cancer*, 1953, **6**, 149.
7. Falls, J. L. *Ibid*, 1955, **8**, 143.
8. Lyons, W. R., Johnson, R. E., Cole, R. D., Li, C. H. Hypophyseal Growth Hormone, Nature and Actions. New York, 1955; p. 461.
9. Nelson, W. O. Ciba Foundation Colloquia on Endocrinology. London, 1952; vol. 4, p. 402.
10. Moon, H. D., Simpson, M. E., Li, C. H., Evans, H. M. *Cancer Res.* 1950, **10**, 297, 364, 549; *Ibid*, 1950, **11**, 535; *Science*, 1952, **116**, 331.
11. Koneff, A. A., Moon, H. D., Simpson, M. E., Li, C. H., Evans, H. M. *Cancer Res.* 1951, **11**, 113.
12. Pearson, O. H. *Advanc. intern. Med.* 1956, **8**, 215.
13. Pearson, O. H., Ray, B. S., Harrold, C. C., West, C. D., Li, M. C., Maclean, J. P., Lipsett, M. B. *J. Amer. med. Ass.* 1956, **161**, 17.
14. Lipsett, M. B., Pearson, O. H. *Med. Clin. N. Amer.* May, 1956, p. 773.
15. Archer, B. H. *N.Y. St. J. Med.* 1953, **53**, 328.
16. Loeser, A. A. *Brit. med. J.* 1954, ii, 1380.
17. Trentin, J. J., Hurst, V., Turner, C. W. *Proc. Soc. exp. Biol., N.Y.* 1948, **67**, 461.
18. Luft, R., Olivecrona, H., Ikkos, D., Nilsson, L.-B., Ljunggren, H. *Amer. J. Med.* 1956, **21**, 728.
19. Baron, D. N. *J. clin. Path.* 1956, **9**, 358.
20. Kennedy, B. J. *Amer. J. Med.* 1956, **21**, 721.

all results of hypophysectomy are superior to those of adrenalectomy, and their patients survived on the average 4 months longer after hypophysectomy than after adrenalectomy; but they emphasise that the differences were not statistically significant. Objective remissions have also followed hypophysectomy in 3 cases of carcinoma of the male breast.[13 18] The results of hypophysectomy in carcinoma of the prostate have been less promising, as have those of adrenalectomy, though temporary objective remissions have been achieved in a few patients in whom endocrine therapy had been ineffective or in whom the condition had relapsed after such treatment.[12 13 18] The operation has been of no benefit in malignant melanoma,[12 13 18 21] hypernephroma,[3] chorioncarcinoma,[12 13 18] seminoma,[22] adrenocortical carcinoma with Cushing's syndrome,[23] carcinoma of the thyroid,[12] and reticulum-cell sarcoma.[12]

There is still no satisfactory means of predicting which patients with breast cancer will respond to adrenalectomy or to hypophysectomy. The histological characters of the tumour are of no help, and there is no correlation between counts of mitotic cells and the response to treatment.[24] There is also no difference between responsive and unresponsive cases in the urinary output of œstrogens and gonadotrophins.[5] Now, however, Dr. MERIVALE and his colleagues, on p. 496, report that the ratio of 11-deoxy-17-ketosteroids to 11-oxygenated or 11-hydroxylated 17-ketosteroids was greater than one in the 11 patients who benefited from adrenalectomy or hypophysectomy and less than one in the 4 patients who did not respond (in these 4 cases the pattern of preoperative excretion resembled the postoperative pattern). Estimation of mammatrophin likewise promises to be of value in assessing the hormone-dependence of breast cancer. This substance, which is probably prolactin, is present in the urine of all normal pre-menopausal women during the second half of the menstrual cycle, and in some 58% of normal post-menopausal women. This figure accords with the proportion of human breast cancers which are hormone-dependent—that is, approximately 50%. From a limited series of observations, it seems that a high output of mammatrophin is usually associated with a significant regression of the growth after hypophysectomy, and conversely.[25–27] Studies of the calcium balance may also help when there are osteolytic metastases: the urinary calcium excretion in such cases falls after oöphorectomy and rises with the administration of œstrogens[28 29]; and it has been suggested that a rise in urinary calcium excretion in response to a provocative dose of œstrogen, or a fall in excretion induced by cortisone, may indicate that the tumour is hormone-dependent and therefore likely to respond to adrenalectomy.[29] LUFT et al.[18] suggest tentatively that in post-menopausal women the chances of benefit from hypophysectomy become progressively less after the menopause and that women over 60 are unlikely to respond; their results also suggest that the response was less satisfactory when the growth had been present for a long time and when there were extensive metastases in the liver and brain. KENNEDY[20] states that the pre-menopausal patient with advanced cancer of the breast who responds to therapeutic castration will probably respond to subsequent hypophysectomy, and that post-menopausal women who respond to œstrogens or androgens will probably also improve after hypophysectomy. And further remissions may result from hypophysectomy in patients who have already undergone oöphorectomy and adrenalectomy. PEARSON et al.[12 13] believe that a favourable response to oöphorectomy or androgen therapy means that the patient is likely to respond to hypophysectomy, but failure to improve on androgens or œstrogens does not preclude a subsequent response to hypophysectomy.

Some of the disappointments in the early days of hypophysectomy were undoubtedly due to the incomplete removal of the anterior lobe. Better results have been obtained since ZENKER's solution was applied to the sella to necrose remnants of pituitary tissue.[12 18] (RUSSELL's findings[30] indicate that division of the pituitary stalk is followed by selective necrosis of the anterior pituitary and almost total loss of pituitary secretion; but the promise of this simpler procedure does not seem to have been fulfilled.) The development of signs of hypopituitarism serves as a guide to the completeness of hypophysectomy.[14] If the gland has been completely removed, adrenal insufficiency appears within 2 to 3 days if no cortisone is given. The usual replacement therapy is 200–300 mg. cortisone daily, starting on the day before operation, and decreasing gradually after operation to 50 mg. daily by the end of the first week.[13 18] The Guy's team use larger doses (up to 400 mg. daily) for several days before operation; and they implant 300 mg. of deoxycortone acetate after operation. Occasional patients need no maintenance therapy, even though subsequent necropsy has shown that all anterior pituitary tissue was removed. After hypophysectomy the urinary 17-ketosteroid output falls to 0·5–2 mg. per 24 hours, the growth of axillary and pubic hair is retarded, and menstruation ceases; vaginal smears become post-menopausal in character after 1 week and completely atrophic after 2 to 4 weeks. Gonadotrophins usually disappear from the urine after 2 to 3 weeks but occasionally not for 2 to 3 months; but there are no definite menopausal symptoms. Hypothyroidism invariably develops, and the serum level of protein-bound-iodine usually begins to drop after a week and may fall to zero. A prompt fall is good evidence that the hypophysectomy has been complete. The ^{131}I uptake of the thyroid gland may fall equally promptly, but it often stays at about 10% of normal for some months and the thyroid gland may remain palpable for several months. The serum-cholesterol level rises slowly by an average of 60 mg. per 100 ml. Clinical myxœdema does not usually appear until 1 to 2 months have elapsed and sometimes not for 4 to 6 months. 60–180 mg. of dried thyroid daily is needed to maintain a euthyroid state. A mild and variable degree of diabetes insipidus develops in

21. Shimkin, M. O., Boldren, E. B., Kelly, K. H., Bierman, H. R., Ortega, P., Naffziger, H. C. *J. clin. Endocrin.* 1952, **12**, 439.
22. Gilbert-Dreyfus, Pertuiset, B., Savoie, J. C., Sebaoun, J. *Ann. Endocr., Paris*, 1954, **15**, 351.
23. Knowlton, A. I., Pool, J. L., Jailer, J. W. *J. clin. Endocrin.* 1954, **14**, 205.
24. Wolff, B. *Guy's Hosp. Rep.* 1957, **106**, 53.
25. Scowen, E. F., Hadfield, G. *Cancer*, 1955, **8**, 890.
26. Hadfield, G., Young, J. S. *Brit. J. Cancer*, 1956, **10**, 45.
27. Hadfield, G. *Brit. med. J.* 1956, i, 94, 1507.
28. Pearson, O. H., West, C. D., Hollander, V. P., Eschner, G. C. *J. clin. Endocrin.* 1952, **12**, 926.
29. Emerson K., Jessiman, A. G. *New Engl. J. Med.* 1956, **254**, 252.
30. Russell, D. S. *Lancet*, 1956, i, 466.

50–60% of patients.[19 20] The polyuria can often be controlled by posterior-pituitary snuff (40 mg. one to three times daily); sometimes pitressin tannate in oil (5 mg.) is needed intramuscularly every second or third day.[12 13 20] Other sequelæ of the operation include defects in the visual fields, anosmia, and occasional transient hemiplegia or oculomotor palsy.[13 14] The operative mortality is said to be no higher than that of adrenalectomy (PEARSON[12] puts it at not more than 10%); and those who respond well may be able to return to a normal life.

Ileitis, Ileostomy, and Cortisone

IT has been suggested that ulcerative colitis is the non-specific outcome of antecedent trauma from a variety of causes[1]—a hypothesis peculiarly difficult to establish, though a statistical approach based on reliable case-histories might prove profitable. Meanwhile, the fringes of the central problem of what causes ulcerative colitis are being lightened in several ways, and ileitis provides an example. Ten years ago it was common to hear about the dangers of retrograde ileitis following ileostomy. The condition had a high mortality; and it was thought that ileitis secondary to the colonic disease spread rapidly up the small intestine after the interference of an ileostomy. MCCREADY et al.[2] held that ileostomy was contra-indicated in such circumstances; and, in order to avoid fistula and ileostomy diarrhœa, DENNIS[3] took the precaution of examining the ileum histologically at the site of section and, if he discovered evidence of ileitis, chose a higher level with normal ileum for the ileostomy. COUNSELL[4] studied 18 cases of colo-ileitis from a series of 107 treated by primary colectomy or ileostomy and subsequent colectomy; he found that ileitis healed after either ileostomy or primary colectomy, whether the site of the stoma was involved or not. BROOKE's results[5] were substantially the same in a late follow-up of 126 patients; excluding a patient with colo-ileitis who died from obstruction, ileitis did not recur in 14, half of whom had been followed for over three years.

Why is there this discrepancy between the views of MCCREADY et al. and DENNIS and the evidence of COUNSELL and BROOKE? COUNSELL's explanation that a confusion had arisen between two conditions is probably correct. WARREN and MCKITTRICK[6] drew attention to the condition of ileostomy dysfunction, a complication arising soon after operation and made manifest by colic and much loss of fluid from the stoma. This condition can arise without previous ileitis, and it is ascribed by some to partial obstruction at the stoma, by others to serositis at and proximal to the ileostomy. Here is ileitis secondary to ileostomy, but differing histologically from ileitis secondary to ulcerative colitis. Moreover, it can be responsible for perforation, which does not occur in the ileum affected by colo-ileitis; and it may lead to serious trouble and even death from electrolyte depletion. It seems reasonable to suppose, therefore, that the ascending ileitis feared by MCCREADY et al. was due, not to pre-existing ileitis, but to an inefficient stoma; and COUNSELL has observed the condition following colectomy for familial polyposis. Certainly "ascending ileitis" is rarely if ever seen today after an ileostomy, and this change coincides with a big fall in the incidence of ileostomy dysfunction—a fall brought about by the simple technique of mucosal eversion, which reduces stomal obstruction[5] and which is also thought by some[7] to eliminate serositis. Other things have doubtless contributed to this improvement: for example, catheters are no longer left indwelling at the ileostomy after operation, as was the custom ten years ago; and electrolyte imbalance, involving sodium and potassium in such a way as to render small-bowel propulsion less effective, is now better understood. In centres where ileostomy is undertaken by experienced surgeons, an undiagnosed Crohn's lesion or entero-colitis, as described by COOKE and BROOKE,[8] is as likely to be the cause of post-ileostomy ileitis as is ileostomy dysfunction, though COUNSELL's study of 200 cases at St. Mark's Hospital shows that there is still doubt about the existence as a separate entity of the condition which COOKE and BROOKE described.

Ileostomy dysfunction caused trouble in 130 of WARREN and MCKITTRICK's 210 ileostomy patients, and it was responsible for the death of 7; its elimination is therefore a considerable achievement. But no sooner is one bugbear overcome by surgery than another arises. That cortisone can induce and prolong remissions in ulcerative colitis has been clearly proved by the Medical Research Council trial[9]; but there are some patients who fail to respond and seem to be worse than before. COOPER et al.[10] noted that pre-operative steroid therapy can make the colon friable at operation; and BROOKE[11] has drawn further attention to this hazard. Dilatation of the colon, usually in its transverse part, was observed in the pre-cortisone era, and was a sign of impending perforation. The same condition seems to develop with greater rapidity and malignancy under the influence of cortisone; and the bowel wall disintegrates to such an extent that it becomes replaced by whatever lies adjacent to it, usually the parietes or small bowel, thus raising new and unusual difficulties for the surgeon trying to remove the colon. The atony accompanying the dilatation can sometimes be so gross and extensive that colic results from the attempts of the small gut to propel its contents vis-a-tergo through the amotile reaches in front of it. This colic and the gross abdominal distension have sometimes induced a mistaken diagnosis of mechanical obstruction by a stricture (in fact, stricture in ulcerative colitis rarely causes obstruction, probably because the fæces are so fluid). Ulcerative colitis is primarily a disease of the mucosa, though often the submucosa is affected as well; but when the colon is dilated, ulceration may be seen histologically to have attacked the muscle coat, causing degeneration and destruction of muscle fibres over a wide area. Dilatation and disintegration of the colon in cortisone-treated patients is probably due simply to the mechanical effect of a

1. Brooke, B. N. *Lancet*, 1953, i, 1220. Lumb, G., Protheroe, R. H. B. *Ibid*, 1955, ii, 1208.
2. McCready, F. J., Bargen, A., Dockerty, M. B., Waugh, J. M. *New Engl. J. Med.* 1949, **240**, 119.
3. Dennis, C. *Surgery*, 1945, **18**, 435.
4. Counsell, B. *Brit. J. Surg.* 1956, **44**, 276.
5. Brooke, B. N. *Lancet*, 1956, ii, 532.
6. Warren, R., McKittrick, L. S. *Surg. Gynec. Obstet.* 1951, **93**, 555.
7. Hill, L. D., Stone, C. S., Pearson, C. C. *Arch. Surg., Chicago*, 1956, **72**, 968.
8. Cooke, W. T., Brooke, B. N. *Quart. J. Med.* 1955, **24**, 1.
9. Truelove, S. C., Witts, L. J. *Brit. med. J.* 1954, ii, 375; *Ibid*, 1955, ii, 1041.
10. Cooper, D. R., Stahlgren, L. H., Ferguson, L. K. *Ann. Surg.* 1956, **144**, 19.
11. Brooke, B. N. *Lancet*, 1956, ii, 1175.

bowel wall of rotten fabric giving way under the load of its contents, and not to a state of inertia due to potassium loss. Indeed, serum-potassium levels are not consistently low in such patients, and serum values below 3·0 m.eq. per litre have been recorded without dilatation. Besides, potassium depletion as seen in steatorrhœa or Crohn's disease causes a small-bowel atony leaving the colon relatively less disturbed, whereas the colonic distension of ulcerative colitis is seldom associated with similar small-bowel changes. The fabric seems to rot as ulceration advances unchecked into the muscle, perhaps because cortisone hampers an adequate inflammatory response in this layer. There is substance, therefore, in the suggestion [11] that the degree or depth of damage to the bowel wall should be assessed radiologically before corticoids are given. If pockets are seen outside the bowel lumen or if what has been called "pseudohaustration" is apparent, these should be taken as danger signals, since ulceration has then certainly reached the submissive muscle layer.

Annotations

POLIOMYELITIS VACCINE

IT is almost two years since poliomyelitis vaccine was licensed for manufacture in the United States, and since then manufacturers, doctors, and the public have had their share of anxiety. But there is little cause for alarm in last week's news that distribution of the latest batch of the British vaccine must be delayed until a colour change in certain vials of vaccine, in store since mid-November, has been investigated. As things have turned out, it would of course have been better to defer the announcement from the Ministry of Health about the distribution of the vaccine until it had passed its final scrutiny.

The vaccine contains a colour indicator of pH which is a useful guide to the metabolic state of the tissue-culture during growth of the virus. A change in pH during storage (indicated by the vaccine changing from pink to yellow) might be due to bacterial contamination which had escaped detection earlier in the manufacturing process. This has not apparently been a serious complication in the past. The cause of the pH change is now being investigated. The delay thus involved, disappointing though it is, illustrates the enormous care that is being taken to make the vaccine as safe and effective as possible.

There are clearly many difficulties still to be overcome in producing poliomyelitis vaccine, and at a recent meeting of the New York Academy of Sciences Dr. J. E. Smadel reported that, even after two doses of present-day commercial vaccine, antibodies sometimes failed to appear in children with no pre-existing antibodies to any of the three poliomyelitis viruses. Smadel thought that this might be due to the current practice of ensuring safety by repeated filtration, and consequent loss of antigenicity. From the start, the fundamental trouble with formalinised poliomyelitis vaccine has been the narrow margin between a vaccine which has not been sufficiently inactivated and contains live virus and a vaccine which has been over-formalinised and is not a sufficiently potent antigen. The result has been that different batches of vaccine, supposedly made by the same methods, have varied greatly in their behaviour. It may have been unwise to invest so much in formalinised vaccine, and the possibilities of inactivating the virus in other ways should still be investigated.

DOCTORS AND UNEMPLOYMENT BENEFIT

A FEW years ago it would have been unthinkable that doctors should draw unemployment benefit, but some of them are doing so today. Most of these unemployed doctors are no more than temporarily out of work, and they are usually young men who have had difficulty in getting a house-job, though there are rare instances where a hard-pressed registrar has asked for help. As we have earlier observed,[1] circumstances can arise whereby weeks and even months may be lost by a newly qualified man between his first and second preregistration jobs; and no longer can this period be filled profitably by a locum tenancy in general practice. During one appointment of six months few housemen can save much against a rainy day and some of them naturally turn to the State for support during the temporary lean period. Indeed, they have already contributed money as an insurance against this very predicament.

Another influence, perhaps more forceful than the preregistration year, is the climate of the times. As taxation eats into personal income and contributions to National Insurance make further inroads, it seems hard to reproach professional men for claiming their due from the State when they are in difficulties. On the other hand, it was no doubt the prevalence of the "claim-what-you-can" attitude, rather than real hardship, which led a newly registered doctor, who had a month to wait before his next appointment, to claim unemployment benefit for that period, with allowances for his two children, though his wife, also a doctor, would be continuing to earn. He even wondered whether he might successfully apply for National Assistance because the mortgage-rates on his house were high. He had no doubts about getting unemployment benefit for the whole period, since it seemed unlikely that the labour exchange would be able to find him a job in his "trade" which he would in any case have to refuse because of the job to which he had already been appointed.

Such a story may shock doctors of an older generation; nevertheless, we hope they will not support the action of the dean of one medical school who (we understand) refuses testimonials to any man who has drawn unemployment benefit. Doctors have all the rights of other citizens, including the right to behave how they wish in such matters; and there are undoubtedly instances of genuine need.

FRACTURE OF THE ODONTOID PROCESS

CONSIDERABLE violence is usually necessary to fracture the odontoid process of the axis, and the injury is now most commonly seen after road accidents. The mechanism of the fracture has aroused much interest. Undoubtedly the sudden movement of the head upon the upper cervical spine imposes an immense strain upon the odontoid, which is probably damaged by a combination of traction and leverage through the alar ligaments. Wusthoff [2] has emphasised the importance of the transverse ligament in the production of odontoid fractures, but in certain lesions the anterior arch of the atlas must be of equal importance. Patients with this injury usually have severe pain, often radiating to the occipital region. The head is sometimes rotated, making X-ray examination difficult, and the patient may support it with his hands. Paraplegia is present from the start in about 10% of the patients who survive the immediate injury; but the proportion may really be much higher, since severe cord damage at this level is always fatal.

Up to the age of 6 years the primary centre of ossification of the odontoid is separated from the centre for the body of the bone by a cartilage plate. Blockley and Purser [3] have shown that in the young child the injury is similar to an epiphyseal separation, and is normally

1. *Lancet*, 1955, i, 240
2. Wusthoff. *Dtsch. Z. Chir.* 1923, **183**, 73.
3. Blockley, N. J., Purser, D. W. *J. Bone Jt Surg.* 1956, **38B**, 794.

followed by firm bony union. In the adult, however, bony union is uncommon and occasionally a late paraplegia follows. Although this complication usually appears within the first year after injury, it has been reported as long as 28 years later. If the paraplegia is due to instability, then early spinal fusion might be expected to lessen its incidence.

The early treatment of the fracture demands traction, and the skull calliper is undoubtedly the best method. Careful positioning may assist reduction if the fragment is displaced, and by flexing or extending the head accurate alignment of the fragments is possible. Even for the undisplaced fracture, light traction affords a convenient method of immobilisation. If the fracture can be maintained in a good position for 3 months it may well unite, although even then fibrous union is not uncommon. Such a result is compatible with good function and freedom from pain, but nervous complications may ensue.

DEODORANTS AND THE SKIN

DEODORANTS are amongst the most commonly used cosmetic preparations, and they are marketed in the form of liquids, creams, pastes, powders, or sticks. They are of two types: substances which destroy or obscure the odour and those which, being astringents, diminish the flow of perspiration. Most preparations contain a proportion of each type. The first group includes such substances as sodium perborate, zinc peroxide, hexamethylenetetramine, chloramine-T, chlorothymol, oxyquinoline sulphate, perfumes, and essential oils. Among the astringents, which act by precipitating skin proteins, thus blocking the ostia of the sweat-ducts, are formaldehyde, aluminium chloride, sulphate, and phenolsulphonate, zinc salicylate and phenolsulphate, tannic acid, and the tannates. Formaldehyde is now rarely used, since, in an effective strength, it is a primary irritant. The very efficient aluminium salts are often used in liquid preparations; they are also primary irritants and sensitisers, but their irritant effect can be eliminated by buffering the solution with urea.

Dermatitis caused by deodorants is usually confined to the axillæ, where it takes the form either of a sharply limited erythematous vesicular eruption or a folliculitis. Patch testing will confirm the cause of the eruption and distinguish it from dress-shield dermatitis. Rubin et al.[1] have lately described a new type of local skin reaction in the axilla after the use of certain deodorants. They record 4 cases in detail and they mention that they have already seen 11 other similarly affected patients. Of the first 4 patients, 3 had used stick deodorants and 1 a liquid preparation. After periods varying from two days to a month, irritation and an eruption suddenly appeared in the axillæ. The rash consisted of dusky reddish-brown discrete papules 1–4 mm. in diameter. They were closely set in the domes of the axillæ and more sparsely placed at the periphery. The lesions looked semi-translucent but no fluid could be extracted by puncture. An "apple-jelly" appearance was produced by diascopy. Treatment with superficial X rays and topical hydrocortisone had little effect except for a slight yellowing in colour and moderate scaling.

Histological sections from a biopsy specimen of an axillary papule from each patient showed a tuberculoid granuloma situated in the corium. It consisted of epithelioid cells and Langhans giant cells surrounded by lymphocytes in typical tuberculoid pattern. Necrosis was absent. The sharp delineation of tubercles as seen in sarcoidosis was lacking. The infiltrate lay along the course of the blood-vessels. Foreign bodies could not be detected by polaroscopic examination. The stick deodorant used by 3 patients contained, apart from the commonly used ingredients, sodium zirconium lactate, but this substance could not be demonstrated spectrographically in the biopsy specimen from 1 patient. The lotion used by the 4th patient contained chlorhydroxyaluminium sulphate but no zirconium.

Rubin et al. say they cannot be certain of the cause of this granulomatous eruption. They mention a linear distribution of lesions and they are now investigating the possible rôle of razor abrasions. They do not say whether any or all of their patients wore dress shields and if so whether sensitivity to them had been excluded. In any case, this type of granulomatous reaction is unusual and further observation is needed.

1. Rubin, L., Slepyan, A. H., Weber, L. F., Neuhauser, I. *J. Amer. med. Ass.* 1956, **162**, 953.

OPEN HEALING OF TUBERCULOUS CAVITIES

EVEN after long periods of chemotherapy for chronic pulmonary tuberculosis, tubercle bacilli can often be cultured from the walls of cavities in resected specimens by simple [1] or elaborate [2] methods; and we have referred [3] to some of the changes in the lesions after chemotherapy. Perhaps the most important, and certainly one of the most interesting, aspects of chronic tuberculosis is open cavity healing in the lungs—a type of healing recognised as very rare before the days of chemotherapy.[4] Auerbach [5] pointed out that open cavity healing was commoner after chemotherapy (his examples referred to treatment with streptomycin plus *p*-aminosalicylic acid), that the cavity walls were thinner the sooner treatment was begun, and that the draining bronchus was re-epithelialised. Thomson [6] showed that the incidence of open cavity healing had risen remarkably with the introduction of isoniazid, and that two-thirds of such cavities became completely healed, though areas of minute ulceration were still present in the other third. No tubercle bacilli could be seen in sections of the walls. In resected lesions including more than cavities, Allen [7] found that over 10% were positive on culture and 10% on smear. In 10% of Allen's patients the disease became active again after chemotherapy, even after conversion (by a combination of all three drugs) of gastric washings and sputum; and Allen recommends surgery after three or four months' chemotherapy, especially for thick-walled cavities, caseous masses over 2 cm. in diameter, and bronchial stenosis or bronchiectasis.

A careful clinical, pathological, and bacteriological study of persistent thin-walled cavities has lately been reported by Keers et al.[8] From the first 10 out of 14 patients who had such cavities and whose sputum had been converted by a few months' chemotherapy of various combinations, the lesions were resected after a further four months' or more chemotherapy. The walls of the cavities were sometimes uniformly smooth and sometimes trabeculated; and others showed large or small granular areas with or without caseous material or thin pus. Histologically, the picture was just as variable, and there was evidence of activity even in cavities which looked smooth and shiny. None of the cavities showed complete epithelialisation, though in several of them epithelium had grown from the junction between cavity and bronchus for 2 or 3 cm. along the cavity wall. Elsewhere a smooth fibrous wall sometimes seemed to have a surface layer of flattened fibroblasts. Tubercle bacilli were identified (4 times by culture and 4 times by smear) in 5 out of 9 cavities from 8 patients. Altogether 11 positive cultures were obtained from 3 patients (4

1. See *Poumon*, 1954, **10**, 465, and the next 7 articles.
2. Hobby, G. L., Auerbach, O., Lenert, T. F., Small, M. J., Comer, J. V. *Amer. Rev. Tuberc.* 1954, **70**, 191.
3. See leading article, *Lancet*, 1955, i, 599.
4. Auerbach, O. Transactions of the 12th Conference on Chemotherapy of Tuberculosis, U.S. Veterans Administration, 1953; p. 224. Medlar, E. M. *Amer. Rev. Tuberc.* 1955, **71**, part II, 92.
5. Auerbach, O. *Amer. Rev. Tuberc.* 1955, **71**, 165.
6. Thomson, J. R. *Ibid.* 1955, **72**, 158, 601.
7. Allen, A. R. *Arch. intern. Med.* 1956, **98**, 463.
8. Keers, R. Y., Riddell, R. W., Reid, L. *Tubercle, Lond.* 1956, **37**, 404.

cavities), and of these, three strains from 1 patient were found to be resistant (two completely to P.A.S. and partially to streptomycin, one partially to streptomycin), but all were sensitive to isoniazid and all were sensitive to a combination of the three drugs. These results suggest that the common finding in America [9] of organisms sensitive to isoniazid after treatment with streptomycin and isoniazid is due not so much to the antagonism to streptomycin of the desoxyribonucleic acid in the cavity contents as to the low dose of streptomycin (1 g. every third day), which means that the streptomycin and isoniazid cannot exert their mutual protection. Keers and his colleagues combine their observations to show that only one of the cavities in their series could be described as "healed" and even then there was active tuberculosis elsewhere in the lungs. They have 4 other cases with similar lesions under chemotherapy, and they point out that, while resection gives valuable information, more conclusive evidence can come only from long clinical follow-up of such patients treated by chemotherapy alone.

Stewart et al.[10] investigated bacteriologically and histologically 71 resected specimens of lung tissue, including 50 pulmonary cavities. 11 were described as having smooth shiny walls; and no tubercle bacilli were cultured from 9 of them. The 2 patients from whom bacilli were recovered had had less than twelve months' effective chemotherapy before operation. The most important conclusion of this detailed investigation was that drug resistance and the duration of effective chemotherapy were the main factors affecting healing. Viable bacilli were obtained from 96% of caseous foci and 95% of cavities in these patients in whom drug-resistant bacilli had been demonstrated in the sputum at any time; but the corresponding figures for the drug-sensitive group were 9% and 17%. Only 2% of the lesions from patients who had had twelve to eighteen months' treatment were positive. Stewart et al. claim that chemotherapy can sterilise tuberculous lesions and that open healing of cavities can be achieved provided that only those combinations of drugs known to prevent the emergence of resistant bacilli are used and that treatment is continued for at least twelve months. Even longer treatment may give greater chances of healing; and two years would not now be considered out of the ordinary. Stewart et al. suggest that a long period of chemotherapy may often prove a satisfactory alternative to surgical treatment. This possibility is attractive; but some may feel that the evidence does not yet justify looking at ring shadows in the radiograph with anything but disfavour.

The introduction of isoniazid is one of the reasons why it has been possible to collect so large a series of persistent thin-walled cavities as Keers et al.[8] have done. The fact that isoniazid was part of the treatment of 11 of their 14 patients, and in 12 of them radio-opaque material entered 13 cavities, supports Thomson's finding that open healing of cavities is commonest after isoniazid. Further support for this view comes from a study of urinary tuberculosis with cystitis; Borthwick [11] showed that the three combinations of streptomycin, isoniazid, and P.A.S. all gave good results, but streptomycin plus P.A.S. was more likely to lead to severe bladder contracture, isoniazid plus P.A.S. was followed by practically no bladder contracture, and streptomycin plus isoniazid came in between the two in this respect. Thus, if the aim is to produce fibrosis in any tuberculous lesion, streptomycin, especially with P.A.S., may be the best treatment (though the evidence that streptomycin promotes fibrosis is by no means complete); and to avoid fibrosis and promote as much resolution as possible, isoniazid plus P.A.S. may be the choice. And it may turn out that the same principle applies to lung cavities according to the density of their walls and the possibilities of drainage: for thick-walled cavities which would never resolve but could be sealed off, streptomycin plus P.A.S. may be best; for thin-walled cavities, to get as much drainage and then resolution as possible, a combination including isoniazid may be most effective. At present, however, the choice of drugs cannot be based on these possibilities: for one thing, they are little more than speculations, and for another, different types of lesion are often found in the same patient.

9. Russell, W. F. jun., Dressler, S. H., Middlebrook, G., Denst, J. *Amer. Rev. Tubere.* 1955, **71**, 441.
10. Stewart, M., Turnbull, F. W. A., MacGregor, R. *Tubercle, Lond.* 1956, **37**, 388.
11. Borthwick, W. M. *Ibid*, p. 120.

OFFICIAL OR PROPRIETARY?

FEW people have welcomed the Government's action in multiplying the prescription charges.[1] A less unpopular line of attack on the National Health Service drug bill has been the effort to dissuade doctors from prescribing proprietary drugs, which are often (though not always [2]) more expensive than similar drugs supplied under the official title. Many doctors agree in principle, but feel that certain proprietary preparations have an advantage in practice over the corresponding official preparations, even though their content is apparently identical. This view is supported by the findings of Bagnall and Stock,[3] who subjected 343 samples of barbiturate tablets to tests specified in the *British Pharmacopœia*. The two most important of these are the disintegration test, which measures the capacity of the tablet to break up in the stomach, and the uniformity test, which measures the weight of the drug in the tablet.[4] Thus the uniformity test determines whether the patient is receiving the intended dose, and the disintegration test is a guide to whether or not the drug will be absorbed. Of the 343 samples, which included drugs marketed under both official and proprietary titles, 79 failed to conform to pharmacopœial standards; most failures were in the disintegration test. 11 of the samples were proprietary mixtures which need not have complied with the *B.P.* requirements, but in fact all did so.

Bagnall and Stock point to the startling difference in quality between the tablets of different manufacturers. No fault was found in the 83 samples which represented four firms, but of the 67 samples representing two other firms no fewer than 42 were below standard. The age of a tablet influences its disintegration, but 5-year-old tablets from some firms behaved better than 5-week-old tablets made by others; and even 18-year-old tablets made by one firm still fulfilled the *B.P.* requirements. There were some surprising variations in the dose of active material among tablets of a given batch (up to 25%); and $^1/_2$-grain tablets were found in a tin labelled $1^1/_2$ grains.

Some drug manufacturers, on both sides of the Atlantic, spend a lot of money on research which is important, even indispensable. Other firms with lower standards make no such contribution, and they can thus undersell their competitors, but their products may be inferior. Though a higher price does not guarantee a better product, a lower price often means a poorer one, even though both preparations carry the same pharmacopœial name. If a doctor's experience has convinced him that certain proprietary medicines are better than those which may be supplied as official equivalents, it is clearly his duty to reject what he considers an inferior substitute. Until stricter control has ensured that the *B.P.* standards are maintained and that preparations which do not satisfy them are rarely if ever supplied, the Government cannot assure prescribers that official preparations are *invariably* as effective as the corresponding proprietaries.

1. See *Lancet*, 1956, ii, 929.
2. *Ibid*, 1953, ii, 815.
3. Bagnall, H. H., Stock, F. G. *Pharm. J.* 1956, **177**, 441.
4. British Pharmacopœia. London, 1953; p. 555.

Special Articles

PAPWORTH'S RESULTS

Rehabilitation of the Tuberculous under the Ministry of Labour Training Scheme 1948-55

OWEN CLARKE
M.D. Camb., M.R.C.P.
CONSULTANT CHEST PHYSICIAN, CANTERBURY

D. MACCALLUM
M.B. Glasg.
CHIEF MEDICAL OFFICER, ENHAM-ALAMEIN

R. B. MURPHY
M.B. Belf., D.P.H.
S.H.M.O. REHABILITATION OFFICER, PAPWORTH

R. R. TRAIL
C.B.E., M.C., M.D. Aberd., F.R.C.P.
MEDICAL DIRECTOR, PAPWORTH AND ENHAM-ALAMEIN VILLAGE CENTRES

THE main effort made by the community on behalf of the disabled worker and his family takes the form of financial grants. The idea of Papworth, first propounded by Varrier-Jones forty years ago, has been different—namely, to provide the tuberculous with work and wages under sheltered conditions.

Up to the outbreak of the late war the hospital and industries at Papworth developed steadily, and they were able to play a part in the industrial war effort. But, when more and more Servicemen required rehabilitation, there was obviously need for schemes of training that could be started early in treatment, while the men were still receiving their Service pay, and which should be directed to fitting them for normal civilian employment as soon as they were restored to health.

The introduction of the National Health Act of 1948 opened the way for Papworth to extend this side of its work, and a coördinated scheme was started with the Ministry of Labour, who recognised Papworth and Enham-Alamein as training centres.

The Scheme

Under this scheme patients can come to Papworth or Enham-Alamein as soon as they are fit for three hours work daily, and increase gradually to six hours daily. No hard-and-fast rules are made about the length of residence; each patient is considered on his needs and training may last as long as three years. The object is to place him in self-supporting work as soon as possible, though the aim must always be to see him trained sufficiently to command trade-union membership.

A positive sputum is no bar to admission: indeed it is one of the best reasons for admission because chemotherapy can be safely continued during training. Papworth, because it is also a sanatorium, can offer earlier training than other centres which accept also men with other forms of disability.

Selection

After perusal of radiographs and reports, patients (both men and women) are accepted on the assurance that the local chest physician thinks them fit to start three hours' work daily at once. A few are interviewed first, but most of them arrive virtually unchecked and with little idea of their future programme.

Some of our trainees were "old lags" whom chest physicians hoped to get rid of; some had been promised a house at once; some were youngsters whose careers had not yet started and who were eager to train; but most were ordinary folk whose lives had been upset by tuberculosis and who hoped for a fresh start in life.

The first three months is regarded as a probationary period during which the trainee, the chief medical officer, and the industrial manager can assess the future. The patient may not, in fact, be fit enough to start work; he may be uncoöperative or unsuitable for training; or he may not like what he finds and may prefer to go home. In view of our method of acceptance this trial period is a valuable safeguard.

Seven Years' Results

From 1948 to 1955 926 men and women were accepted for training at our two centres, Papworth and Enham-Alamein. Of these, 63 (7%) did not complete the probationary period. Of the remaining 863, 211 were still in training at the time of the review. Of the 652 who had terminated training 162 (19%) had been "colonised"—i.e., they had reached a standard of industrial proficiency acceptable to the appropriate trade union and had been offered work at Papworth. A further 60 trainees had completed training to the satisfaction of the authorities, but had decided not to remain at Papworth. Many had been offered employment nearer their homes.

Reasons for Leaving Prematurely

409 (47%) ended their training prematurely for the following reasons:

To take other work	120
To a different training course	23
Marriage	15
Other domestic troubles	61
Unsettled (own request)	66
Discharged (unsuitable)	47
Unfit (requiring treatment)	70
Died	7

It will be seen that a third of this group left either to take other work or to change on to a different training scheme. Obviously it is not possible to provide more than a few trades at one centre, and transfers to other centres were arranged by the authorities if the man seemed a responsible person, medically fit, and likely to continue training. These figures show that 365 (56%) of those who left the scheme had either completed training (34%) or found work elsewhere; they form the obvious successes.

Those who left to take other work usually had found more suitable or more congenial employment nearer home. Many of them had come to Papworth because they could not get such work, and their departure was a satisfactory sign of increasing skill and increased confidence in themselves.

The "domestic" reasons for leaving cover the sad difficulties which accompany long separation: it is wisest to recognise the inevitable, and if the man returns home the disruption of a family may often be avoided. One effort at rehabilitation is of small significance in a man's life, compared to the permanent tragedy of a broken marriage. In considering requests for early discharges and extra leave the training centre must always be prepared to compromise.

The 66 who left of their own accord because they were "unsettled," and the 47 who were discharged as unsuitable together make 13% of the entry. This percentage is comparable to the self-discharge rate of many sanatoria. Most of them had not been on the training scheme for six months and were still only doing three hours work daily. It may be that an adequate explanation of their progress had not been given to them, or that they were temperamentally unsuited to a long apprenticeship. Whatever the cause, in this group the training was unsatisfactory, though they were assessed as suitable during their probation.

Length of Training

Of the 402 who left, 278 had been training for more than six months, and 265 were working five hours or more a day. The following figures show the time spent at each grade of training by those who completed the training (A) and those who did not (B).

	(A)	(B)
3 hours' work daily	25 weeks	23 weeks
5 hours' work daily	31 weeks	23 weeks
6 hours' work daily	41 weeks	11 weeks

The real difficulty thus lay in the long period on six hours daily which was needed to reach an adequate industrial standard. Obviously training cannot be really intensive until the man is working almost a full day. Those who liked the work stayed the full time: those who were impatient, or needed better money, left as soon as they felt confident of their *medical* stability, or sought a livelihood elsewhere regardless of the risk to their health.

When considering the length of the training it must be remembered that most of the trainees were starting industrial work at a time when they would otherwise be doing grade work in a sanatorium. The first six months, therefore, is one of careful medical control. The training is recognised by the trade unions as apprenticeship in a trade: the usual apprenticeship in ordinary industry is three, five, or more years, and a shorter period is accepted for medical trainees only because they are older men and can progress to responsibility more quickly.

On the average, trainees spent six months on three hours work only, to allow adequate rest during the afternoons. This is essentially a period of medical rehabilitation. The period on five and six hours' work is industrial training. Usually the trainees are ready for colonisation during the second year, but 68 severely disabled patients took over twenty-four months.

Absenteeism

We have defined absenteeism as any absence from work of less than four consecutive weeks, whatever the cause. Longer periods of absence are considered as relapse. This criterion is stricter than that used by the Ministry of Labour for fit people in normal industry; and yet, as the following figures show, our results are as good:

Daily work-span	Absenteeism during training	
	Subsequently colonised	Left before colonising
	(total 162) (%)	(total 469) (%)
3 hours	4·5	6·8
5 hours	5·2	6·7
6 hours	4·5	6·7

In both groups the absentee-rate is remarkably constant, but it is lower among those who later colonised. The records of 50 settlers who have worked in the colony for upwards of thirty years showed the same absentee-rate of 4·5%. The rate throughout industry for 1953 was 4·2%. Judged by these figures, the worker who has had tuberculosis is reliable and industrious, and does not have an unduly high absentee-rate. There is so much at stake, and his chances of employment are relatively so much less, that this is to be expected.

Relapse

Any absence from work for more than four consecutive weeks was counted as a relapse. This obviously includes many cases in which the illness was unrelated to tuberculosis—e.g., one fractured femur due to a motor accident.

Of the 631 trainees 149 had a "relapse" during training, but 86 were able to resume training after treatment, and 24 of these did in fact later colonise. These figures were for 1948–55, and it is uncertain what effect long-term chemotherapy will have on relapse-rates.

The fact that so many of those who relapsed were able to go on with their training shows the value of a training centre where patients can if need arises be admitted into hospital, and after treatment resume training without losing the benefit of their previous experience. Only under such conditions can training be started early in a disease whose prognosis is so fickle. This arrangement gives the maximum of security and opportunity to the marginal cases in which the patient would otherwise have no hope of regaining his economic independence within a reasonable time. No private employer could be expected to carry such a risk: no standard scheme of training for a fixed period on a full day's work could accept these patients in the early stages without excessive risk.

Sputum-positive Patients

Village settlements have been criticised for abandoning their original principles in order to achieve economic success. Most of the patients admitted nowadays, it is said, are so fit that rehabilitation is unnecessary. There are two replies to this assertion.

Firstly, most of the trainees have come to Papworth because they were unable to find employment near home. This may have been due to their medical condition or to natural reluctance and anxiety about resuming work after a long period of treatment in which the need for rest was so constantly emphasised. In either case training for a trade was valuable because it produced a feeling of confidence and ability as well as giving the man a skill with which to earn his living.

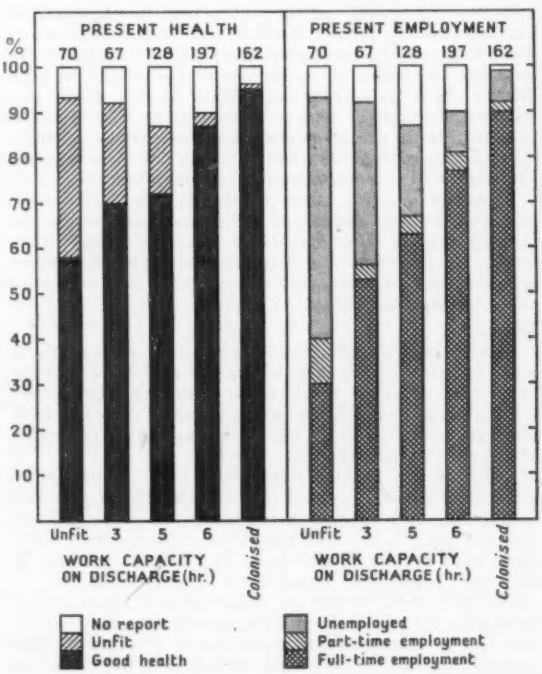
Secondly, 214 (25%) of those accepted for training had a positive sputum on admission, and they have been included in all the results discussed. During their training chemotherapy and/or collapse therapy was started in an attempt to convert the sputum. One of the earliest trials of ambulant chemotherapy reported in this country was done on these trainee-patients.

In 137 patients the sputum was converted during training, and has remained negative during the follow-up period: 77 patients remained sputum-positive throughout, but 15 of these were not considered suitable for any treatment.

Follow-up

Of the trainees who left the scheme either by colonisation or to return home 91% have been traced and have provided information of their present status, health, and employment (see chart). 88% remain under regular medical supervision.

The term "good health" implies that the man feels well, is living a reasonably normal active life, and has



been told by his doctor that he is fit for work. Those who persisted with their training show a better health record and a better employment state.

Of those who left while only doing three hours' work, 76% are now considered fit, but only 51% are in full-time work. Of those who remained to a six-hour grade 87% are reported fit and 77% are fully employed. Of the colonists 90% are in full work at union rates of pay.

Only 5% have managed to find part-time jobs. To advise a patient to take light unskilled part-time well-paid work is as unrealistic today, even in a period of full employment, as it was at the birth of Papworth.

Discussion

The nature of tuberculosis and the rôle of the settlements has changed since they were founded. Today treatment can aim at recovery and subsequent employment. For many patients, their old job is open: others have no job or an unsatisfactory one. A long illness offers them opportunity to train for a better job.

Rehabilitation in tuberculosis should start at the time of admission to hospital and should continue until the man is satisfactorily placed in employment. It should be more than a diversion or occupational therapy: it should be practical training in a chosen trade. The trainee deserves the same individual attention as a patient: his rehabilitation must be planned in the same way as his treatment. As early as possible he should start a few hours' work in a factory, again doing a normal man's job and producing sensible saleable articles.

Time must not be wasted with purposeless grade-work and futile occupation to pass the time. Time is precious to a young man, and doctors must not regard as trivial the valuable months of other people's lives. Rising morale due to clinical recovery must be harnessed as the driving force of full and final economic recovery.

If this is true in tuberculosis it is also true of many other diseases which leave a disability and prevent return to previous employment. In many of them treatment and training could proceed together, and the time could be used to good purpose instead of being a burden on the mind. Often the period of illness can be used to train a man for a job within his future capacity and ensure his continued economic independence.

Papworth has changed its routine to keep abreast of requirements: the Ministry of Labour scheme is built on that experience and its results are good.

MEDICAL INSURANCE AGENCY

THE Medical Insurance Agency, which this month reaches the half-century mark, was puny in its earliest years and none too robust in those that followed; but now, in full maturity, it is massive and sound, vindicating the judgment of the two men who had the idea of bringing it into being. These two were Dawson Williams, editor of the *British Medical Journal*, and Squire Sprigge, editor of *The Lancet*. The story goes that, meeting for luncheon, they fell to talking of the large commission which an agent had received for a life-assurance policy taken out by a doctor; and this led them to agree that an organisation should be set up to secure the best possible terms for each doctor, paying rebates to the insured persons and turning over the surplus to medical charities.

The first meeting of the Agency (known until 1913 as the Medical Insurance Committee) was held on March 7, 1907, under the chairmanship of Radcliffe Crocker, treasurer of the British Medical Association. (Throughout its fifty years the Agency has been powerfully supported by the association, but has always operated independently.) In 1909, on Crocker's death, G. E. Haslip took over the chairmanship, approaching his task with lively vigour. In its first years the Agency had been concerned chiefly with insurance against risks under the Workmen's Compensation Act of 1906; but in 1909 motor-car business was undertaken and proved immediately successful, and in the next few years life assurance increased apace. After Haslip died in 1924, Sir Humphry Rolleston was appointed chairman, holding office until he resigned in 1942, when he was succeeded by Sir Robert Hutchison. When he, in turn, resigned in 1947, Dr. James Fenton was elected, and he continues in office.

In the early years after the late war, the Agency arranged many loans for the purchase of practices. When the National Health Service Act came into force in 1948, these purchases stopped, but the gap was largely filled by loans for housing. Since the end of the war the business transacted by the Agency has grown impressively. Whereas in 1946 premiums collected amounted to £450,000, in 1956 they totalled over £2 million; and whereas in 1946 £5000 was distributed to medical charities, by 1954 the figure had increased to £24,500. Much of this success can be ascribed to two men—Dr. Henry Robinson, the hon. secretary since 1938, and Mr. A. N. Dixon, the general manager. After his appointment, Dr. Robinson took a leading part in a thorough overhaul of the Agency's affairs, and it was decided to secure a trained insurance expert as manager. Mr. Dixon's appointment (he was one of 550 candidates) resulted.

The Agency's reputation stands deservedly high. In seeking insurance through it a doctor serves well not only himself and his own family but others less fortunately placed. It is not often that two such diverse purposes can be so surely achieved by a single step.

Medicine and the Law

Subject to Correction

A COLLIERY worker, whose right eye had been injured in an accident at work in 1936, suffered a further injury at work, this time to his left eye, in March, 1955, as a result of which he was rendered almost totally blind. He claimed disablement benefit under the National Insurance (Industrial Injuries) Act, 1946, which requires, where a worker has suffered injury to a "paired organ," that the medical board must assess the extent of disablement in accordance with regulation 2(5) of the National Insurance (Industrial Injuries) (Benefit) Regulations, 1948. Two medical boards made provisional awards assessing the extent of the disablement at 100%; but a third board, in March, 1955, made no award. The worker thereupon appealed to the Medical Appeal Tribunal at Newcastle-upon-Tyne, which, on June 13, 1956, made an award assessing the disablement at 20%. That award showed clearly that the tribunal had overlooked the requirements of regulation 2(5).

The worker applied *ex parte* to the Divisional Court of the Queen's Bench Division, asking *inter alia* for an order of *certiorari* to quash the tribunal's decision on the ground that there was a manifest error of law on the face of that decision. The Divisional Court dismissed the application; but the Court of Appeal gave leave to appeal. When the appeal came on for hearing, counsel for the Ministry of Pensions and National Insurance and for the tribunal conceded that there was such an error and did not oppose the application for *certiorari*; he also stated that the tribunal would redetermine the claim and make a new assessment; but the Court took time to consider whether it had jurisdiction to make the order asked for, in view of the fact that section 36(3) of the Act of 1946 provides that "any decision of a claim or question . . . shall be final."

Lord Justice DENNING, reading his reserved judgment, said that it was clear that the tribunal had gone wrong in law, and its error appeared on the face of the record. The point then arose as to the effect of section 36(3) of the Act of 1946, which said that "any decision of a claim or question . . . shall be final." Did those words preclude the Court of Queen's Bench from issuing an order of *certiorari* to bring up and quash the decision? On looking again into the old books his Lordship found it very well settled that the remedy by *certiorari* was never to be taken away by any statute except by clear and explicit words. The word "final" was not enough; it meant only "without appeal." It made the decision final on the facts but not on the law.

The value of this ancient writ was well shown by the present case, for it was only by reason of it that a workman blinded at work had obtained the industrial-insurance benefit to which he was by law entitled, as now acknowledged on all hands. The order must issue to quash the tribunal's decision. The tribunal would consider the claim afresh and no doubt come to a right decision on it.

Lord Justice ROMER, concurring, said that it would have been deplorable if the Court had been constrained to hold that the decision of a medical appeal tribunal, however obviously wrong in law, was immune from review by Her Majesty's Courts. The tribunals did their work conscientiously and efficiently; but in the nature of things they were bound to go wrong from time to time in matters of law. Their members consisted in the main of people who had devoted their lives to activities far removed from the study and practice of the law, and neither by training nor experience could they be expected to have that knowledge of the principles of construction which was so necessary for the proper understanding and application of the statutes and regulations which often came before them.

Lord Justice PARKER delivered a concurring judgment. The appeal was allowed.

Regina *v.* Medical Appeal Tribunal. *Ex Parte* Gilmore. *Court of Appeal* (Denning, Romer, and Parker *L.JJ.*) Feb. 24, 1957. David Turner-Samuels (Gaster & Turner for I. E. Geffen, Durham); Rodger Winn (solicitors, Ministry of Pensions and National Insurance).

M. M. HILL
Barrister-at-Law.

Difference in Technique not Negligence

On Aug. 19 and 23, 1954, the plaintiff, then aged 54, a voluntary patient in a mental hospital suffering from an anxiety state was given electro-convulsive therapy (E.C.T.). During the course of the treatment on Aug. 23, he sustained bilateral "stove-in" fractures of the acetabula. In accordance with his normal practice the doctor treating the plaintiff had given the E.C.T. "unmodified"—i.e., without using relaxant drugs and without applying any form of restraint other than to support the plaintiff's chin and to hold his shoulders. The treatment was given while the plaintiff was lying on a couch and the precautions taken were the use of a gag and the presence of nurses on each side of the couch in case he fell off. The plaintiff sued the hospital management committee for damages for his injuries; his case was, in effect, that they were negligent (1) in failing to warn him of the risks involved so that he had had no chance of deciding whether or not to take those risks; (2) in failing to use any relaxant and/or anæsthetic drug; and (3) since they had not used any relaxant drug, in failing to provide at least some form of control beyond that which was given. The defendants denied negligence.

The doctor who had been in charge of the plaintiff gave evidence to the effect that he was normally opposed to the use of relaxant drugs as he considered that there was, with their use, a risk of mortality while he considered the risk of fracture with unmodified E.C.T. to be minimal; he said that he only gave relaxants in selected cases, where the risk of unmodified E.C.T. would be greater than usual, and that there was no special reason why the plaintiff should have been given a relaxant drug. Witnesses called by either side gave evidence as to the different techniques which they adopted in giving E.C.T.; some used restraining sheets, some relaxant drugs, some manual restraint, but all agreed that there was a firm body of opinion which was opposed to the use of relaxant drugs as a matter of routine although one witness, called by the plaintiff, preferred to accept the risk of relaxants and eliminate the risk of fracture. The witness called for the plaintiff considered that, if a relaxant drug were not given, it would be unwise to give E.C.T. without some form of manual restraint; the defendants' evidence was that they used to provide manual control but had not done so since 1951, that it was their view that the less restraint there was, the less the risk of fracture, and that that view was borne out by their experience. Two of the witnesses treated their patients in an ordinary hospital bed covered by the bedclothes, and one of those agreed that the mattress and bedclothes to a certain extent absorbed and restrained the convulsive movements of the patient. As to warning patients of the risk, it appeared that it was the practice of defendants' doctor to say little about the treatment and to wait for the patients to ask questions; he did not think it desirable to say anything about risks unless asked; if asked, he said that there was a very slight risk. The plaintiff's witness thought that it was not right not to warn a patient of the risk of fracture. It also appeared from the evidence that the nature of the plaintiff's injury was exceptional.

Mr. Justice MCNAIR, summing up to the jury, said that they must bear in mind the enormous benefits which E.C.T. conferred upon patients suffering from certain forms of mental illness. The use of E.C.T. was progressive and they might well think that even today there was no standard settled technique with which all competent doctors would agree on all points. Where there was a difference of opinion among medical men, a doctor was not negligent if he acted in accordance with a practice accepted by a competent body of medical men skilled in that particular art. In other words a doctor who acted in accordance with a particular practice was not negligent merely because there was a body of opinion which took a different view; but at the same time that did not mean that a doctor could obstinately and pig-headedly carry on with some old technique if it was proved contrary to substantially the whole body of medical opinion. It was not for the jury to decide which of two practices was the better.

The allegation that the failure to warn was negligent raised two questions. First, did good medical practice require that a warning should be given to a patient before receiving E.C.T.? The jury might well think that a doctor, dealing with a mentally sick man and having a strong belief that his patient's only hope was E.C.T., should not be criticised if he did not stress the dangers, which he believed to be minimal. If they thought that a warning should have been given, then the second question was, what difference would it have made? The plaintiff, the only person who could have answered, had not been asked that question, and unless they were satisfied that he would not have taken the treatment if he had been warned they might well think that there was nothing in that point. As to the other allegations of negligence, it was for the jury to decide on the evidence whether or not the defendants, in failing to take the action which the plaintiff alleged should have been taken, had fallen below the standard of practice recognised by a reasonably competent body of medical opinion. The evidence as to the use of restraints showed that there were different ways of carrying out the treatment but it was not right

to take that as condemning the practice adopted by the defendants.

The jury found for the defendants, and his Lordship entered judgment for the defendants, with costs.

Bolam *v.* Friern Hospital Management Committee. *Queen's Bench Division* (McNair *J.*, and a jury). Feb. 26, 1957. N. R. Fox-Andrews, Q.C., and Roger Ormrod (Pennington & Son); James Stirling, Q.C., and E. Sutcliffe (J. Tickle & Co.).

J. F. LAMB
Barrister-at-Law.

Public Health

A TUBERCULIN SURVEY OF 1285 ADULTS WITH SPECIAL REFERENCE TO THE ELDERLY

D. GIANNINI
L.R.C.P.E.
REGISTRAR

R. S. SLOAN
M.B. Glasg., D.P.H.
LATE JUNIOR HOSPITAL MEDICAL OFFICER
RUCHILL HOSPITAL, GLASGOW

TUBERCULIN testing in the course of routine clinical work at this hospital has disclosed a surprisingly high number of non-reactors among older people. For this reason a systematic survey of adults was made.

Material

Tuberculin tests were made on persons aged more than 15. It was impossible to survey the general population, but it was thought that a survey of patients admitted to hospitals serving the northern area of Glasgow would be sufficiently representative. Certain patients were excluded:

(1) Those with, or suspected of having, tuberculosis.
(2) Those with conditions which affect tuberculin sensitivity—e.g., acute illnesses, illnesses producing grave debility, collagen diseases, and reticuloses.
(3) Those receiving treatment which might affect tuberculin sensitivity—e.g., cortisone and corticotrophin.

Methods

Tuberculin sensitivity was tested for by the injection of Old Tuberculin (Evans) into the skin of the volar aspect of the forearm. The initial dose was 10 T.U. (0·1 ml. of 1/1000 dilution O.T.). Care was taken to exclude technical errors—e.g., from a leaking syringe—but, to make doubly sure, a second test, using the same dilution of Old Tuberculin, was made if the result of the first was negative. If this second test was negative, a third test, using 100 T.U. (0·1 ml. of 1/100 dilution O.T.) was made.

The results were read at seventy-two hours. If the greatest diameter of the area of induration was 6 mm. or more, the test was regarded as positive.

To ensure uniformity, both of us were present when the tests were made and the results read.

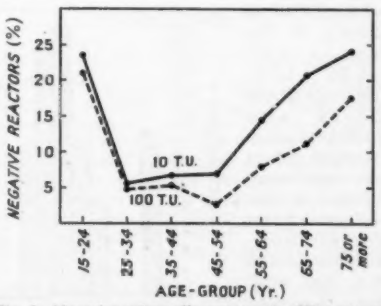


Fig. 1—Negative tuberculin reactors in 1285 patients (695 male and 590 female).

Results

1285 patients (695 males and 590 females) were tested.

Table I shows the distribution of negative reactors to tuberculin in successive age-groups. It will be seen that almost 25% were negative to 10 T.U. (1/1000 O.T.) in the age-group 15–24. In the next three age-groups the proportion of negative reactors was very much smaller; but, from the age-group 55–64 onwards, the proportion increased, until in the age-group 75 or more it was similar to that in the age-group 15–24. The trend for non-reactors to 100 T.U. (1/100 O.T.) was similar. Fig. 1 shows this distribution graphically.

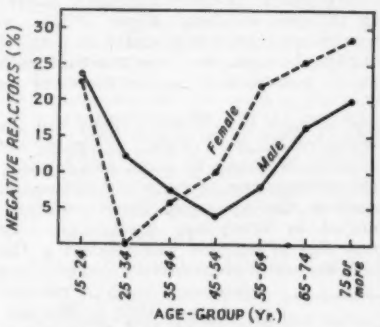


Fig. 2—Negative tuberculin reactors to 10 T.U. according to sex in 1285 patients.

Table II presents the distribution of negative reactors to tuberculin in successive age-groups for males and females separately. In males there was a gradual decrease in the percentage of non-reactors both to 10 T.U. and 100 T.U. from the age-group 15–24 to the age-group 45–54, whereas in successive age-groups over the age of 55 there was a corresponding gradual increase. The proportion of female non-reactors to 10 T.U. decreased very

TABLE I—AGE-DISTRIBUTION OF NEGATIVE TUBERCULIN REACTORS AMONG 1285 ADULTS

Age-group (yr.)	15–24	25–34	35–44	45–54	55–64	65–74	75 or more
No. of persons	124	105	157	228	242	230	199
Negative to 10 T.U. 1/1000	29 (23·4%)	6 (5·7%)	10 (6·4%)	15 (6·6%)	34 (14·1%)	47 (20·4%)	47 (23·6%)
Negative to 100 T.U. 1/100	26 (20·9%)	5 (4·8%)	8 (5·1%)	5 (2·2%)	18 (7·4%)	25 (10·9%)	34 (17·1%)

TABLE II—NEGATIVE TUBERCULIN REACTORS, MALE AND FEMALE, IN SUCCESSIVE AGE-GROUPS

Age-group (yr.)	15–24	25–34	35–44	45–54	55–64	65–74	75 or more
Males (695):							
No. of persons	71	50	81	126	138	118	111
Negative to 10 T.U. 1/1000	17 (23·9%)	6 (12%)	6 (7·4%)	5 (3·9%)	11 (7·9%)	19 (16·1%)	22 (19·8%)
Negative to 100 T.U. 1/100	17 (23·9%)	5 (10%)	4 (4·9%)	1 (0·8%)	6 (4·4%)	7 (5·9%)	14 (12·6%)
Females (590):							
No. of persons	53	55	76	102	104	112	88
Negative to 10 T.U. 1/1000	12 (22·6%)	0	4 (5·3%)	10 (9·5%)	23 (22·1%)	28 (25%)	25 (28·4%)
Negative to 100 T.U. 1/100	9 (17%)	0	4 (5·3%)	4 (3·9%)	12 (11·5%)	18 (16·1%)	20 (22·7%)

sharply from 22·6% in the age-group 15–24 to nil in the age-group 25–34 and increased again sharply from the age-group 35–44 onwards. The trend for female non-reactors to 100 T.U. was similar. It is seen too that the proportion of non-reactors was larger among females than among males after the age of 45. Fig. 2 shows graphically the distribution of non-reactors to 10 T.U. (1/1000 O.T.) in males and females.

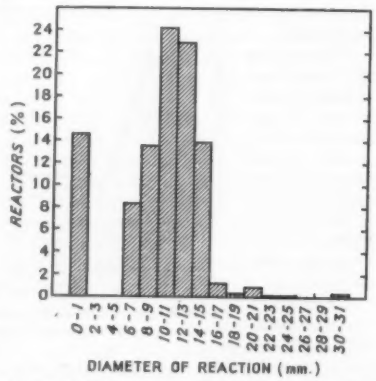


Fig. 3—Reactions to 10 T.U. by size in 1285 patients.

Fig. 3 shows the distribution of reactions to 10 T.U. (1/1000 O.T.) by size in 1285 patients. Fig. 4 shows similarly the distribution of reactions to 100 T.U. (1/100 O.T.) by size in 188 patients who were negative to two 10 T.U. (1/1000 O.T.) tests. Experience has shown that, in recording the size of reactions, there is a bias in favour of approximating to even numbers (Meyer 1951); in figs. 3 and 4 reactions are therefore recorded as 0 and 1 mm., 2 and 3 mm., 4 and 5 mm., &c. It is seen that, with both dilutions of O.T., positive and negative reactions are clearly separated.

Fig. 5 is designed to show the influence of sex and age on the size of positive reactions. For each age-group the average size of reaction is shown in males and females. It is seen that the average size of positive reactions in males was greatest in the age group 25–34 and progressively diminished in succeeding age-groups. In females the average size of reaction was greatest in the age-group 15–24 and decreased progressively in succeeding age-groups until it reached its lowest limit in the age-group 55–64. It increased somewhat in the age-group 65–74 and again in those aged 75 or more. Although the average size of reaction was smaller in the older age-groups than in the younger age-groups, the difference was only 2 mm. Histograms of the size of reactions were made for each age-group of the sexes separately. These displayed a well-marked mode around 9–13 mm. for both sexes and for all age-groups up to the age of 54. The succeeding decade showed a more even spread over 6–15 mm., and thereafter there was no constant picture.

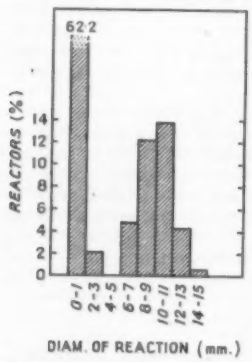


Fig. 4—Reactions to 100 T.U. by size in 188 patients.

Discussion

If the adult hospital population surveyed is representative of the population at large, it seems that, after the age of 55, the proportion of negative reactors increases with age. Few published reports of tuberculin surveys include all age-groups, but the results of Furcolow et al. (1948), Meyer (1951), and Bellomo (1952) are similar to our own. It is true that Bellomo states that the younger the individual the less likely is he to be a reactor to tuberculin, but Bellomo's figures show an increase in the proportion of negative reactors in people aged more than 60. Amazon (1943) and Coury and Marland (1948) found in old people an increase in the proportion of negative reactors in successive age-groups, but that found by Coury and Marland was not striking.

The comparatively high proportion of negative reactors in the older age-groups in the present investigation can scarcely be explained on the basis that these people have never been infected with tuberculosis, for there is no evidence to suggest that during their earlier years they were less exposed to infection than were later generations; indeed the reverse is the case.

Moreover Amazon (1943) and Groth-Petersen and Wilbek (1955) found radiological evidence of previous tuberculosis in many elderly persons in whom tuberculin tests were negative. Indeed Groth-Petersen and Wilbek concluded that, although a negative 10 T.U. test in persons aged less than 50 probably indicated absence of previous infection with tuberculosis, this interpretation could not be made in the case of persons aged more than 50. The fact that the investigations of Groth-Petersen and Wilbek showed negative reactions in persons with evidence of previous tuberculosis in chest films tends to dispose of the improbable proposition that a high percentage were never infected at all.

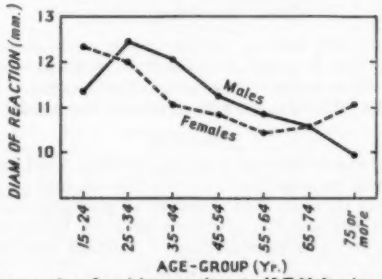


Fig. 5—Average size of positive reactions to 10 T.U. by size and sex in 1285 patients.

The increasing proportion of negative reactors in the older age-groups could be explained by a waning of skin sensitivity to tuberculin with the passage of time. Eventual complete loss of skin sensitivity might indicate that the tubercle bacilli in the body had died or, if still living, they had ceased to provide a sufficient stimulus. On the other hand, it might simply be that, with age, the skin loses its power to react to various stimuli, including tuberculin.

The assumption that the reaction to the tuberculin test tails off gradually with age until it disappears is not supported by the results of this investigation. It seemed that an all or-none law operated. In all cases in which a negative reaction was recorded to 10 T.U. (1/1000 O.T.) there was no induration at all; and in the negative reactors to 100 T.U. (1/100 O.T.) there were only four reactions with any induration, and these measured 2–3 mm., well below the 6 mm. measurement required for a positive result.

The significance of a positive reaction to the tuberculin test in relation to the quantity of antigen injected has been studied by Bates et al. (1951) and Palmer (1953), who concluded that most reactions elicited by a small-dose intradermal test (5 T.U.) indicated infection with tubercle bacilli, but that a positive reaction only to a large-dose test, such as 100 T.U. or 250 T.U., might be non-specific. They suggested that, in certain geographical areas, this large-dose reaction might indicate infection by an organism antigenically related to the tubercle bacillus but non-pathogenic for human beings.

Palmer (1953) also found a wide scatter in the sizes of reaction to large doses of tuberculin (250 T.U.), making the separation of positives from negatives arbitrary. In

the present series there was a clear-cut separation of positive and negative reactors to 100 T.U. (fig. 4).

The morbidity and mortality from pulmonary tuberculosis in older men are comparatively large, and acute forms of tuberculosis are not uncommon in the older age-groups (Rich and McCordock 1929, Spain 1947, Ball et al. 1951, Lees and Munro 1954, Allan et al. 1956). There may be some connection between loss of skin sensitivity to tuberculin and susceptibility to tuberculosis; but, as the proportion of non-reactors among elderly women is even greater than among elderly men, and the morbidity and mortality among elderly women are much less than among elderly men, it seems that other and more important factors operate.

Summary

A tuberculin survey of hospital patients aged 15 or more was made, 1285 patients (695 males and 590 females) being tested.

Patients with diseases or receiving treatment likely to affect tuberculin sensitivity were excluded.

An initial injection of 10 T.U. was given, followed by a further injection of 10 T.U. if the result of the first test was negative. If this second test was negative, a third test, using 100 T.U., was made.

After the age of 34 in women and 54 in men the proportion of negative tuberculin reactors increased in successive age-groups.

We are grateful to Dr. A. W. Lees and Dr. G. W. Allan for their help and encouragement; the clinicians of the Western District Hospital, Stobhill Hospital, and Ruchill Hospital for their coöperation in this investigation; and the Board of Management for Glasgow Northern Hospitals for assistance.

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Infectious Diseases in England and Wales

Disease	Week ended February			
	2	9	16	23*
Diphtheria	5	9	2	2
Dysentery	1097	1290	1274	1296
Encephalitis:				
Infective	2	5	6	1
Post-infectious	2	3	2	2
Food-poisoning	181	165	187	139
Measles, excluding rubella	13,049	16,752	19,710	21,317
Meningococcal infection	32	28	30	26
Ophthalmia neonatorum	21	29	21	27
Paratyphoid fever	10	5	6	8
Pneumonia, primary or influenzal	661	720	676	625
Poliomyelitis:				
Paralytic	28	21	31	30
Non-paralytic	9	13	6	9
Puerperal pyrexia	234	222	270	237
Scarlet fever	865	869	831	890
Smallpox	..	..	..	..
Tuberculosis:				
Respiratory	631	666	643	672
Meninges and C.N.S.	9	5	7	6
Other	78	70	74	80
Typhoid fever	3	6	1	1
Whooping-cough	3302	3148	3163	3190

* Not including late returns.

In England Now

A Running Commentary by Peripatetic Correspondents

THE view has lately been expressed that the sculpture on the proposed Government building in Marylebone should not consist entirely of mongoloid women in an advanced state of elephantiasis. Why ever not? It seems a magnificent Trans-Ural gesture for reorientation of the foreign-policy facies which we present to the wider world. The œdema of our dependent parts at least is realistic. The fragments of our civilisation may one day be dug out of the rubble of our self-immolation to stand alongside the masterpieces of the fifth century B.C. in some global museum.

How instructive it will be to bequeath a record of our pathology. The accessory auricles and polymastia of Roman statuary will be eclipsed by the twilight genius of the Atomic Age. I wonder if the new-world research-workers will divine that we carved hydrocephalic and anencephalic busts for Burlington House long before our genes mutated in the First Ionisation Period. Perhaps they will feel pity for the exfoliative dermatitis of bronze portraiture, admire the acromegaly of our business tycoons, envy the androgen activity of our virile torsos. Will we have time to immortalise our ladies swinging back to Titian, or shall we just scratch their vital statistics on the foundation stones of deep shelters? But some of our artistic efforts seem likely to puzzle comparative anatomists. Learned arguments will flow whether our central abdominal and thoracic foramina were congenital or acquired. Our known heroic habits of pneumonectomy and splenectomy will possibly support the latter view, although experimental work will be most frustrating to reproduce our collateral circulation and famous spinal rigidity. It may be left to some philosopher to guess that the vacant space is where our psyche used to perch.

There is really a lot to be said for the artist capturing the impression of movement in our medical life before it gets any more fossilised of its own accord. I am all for writing and carving on the walls of public buildings. And if we are to combine reorientation with tradition, why not adorn the Inland Revenue with a stony statue, many-armed and palms outstretched, the spirit of our times embodied with a risus sardonicus, tongue-tied in tetanic spasm?

* * *

"Hullo," I said, "it's old Halifax! What are you doing here?"

"Just browsing."

We had been students in the same year. He was a practitioner in the next town, and we met by chance from time to time—on this occasion in a second-hand bookshop. We always discussed the same subject.

"I heard from He-man Jones the other day," said Halifax putting down the book he had been holding. "He's an orthopod now, you know."

"He would be," I remarked. "I ran into Little Billie at a conference recently. Do you know what he's doing? He's a general, if you please!"

"No! I see that Slinky Syme has achieved his ambition of becoming a gynæcologist: in Poshmouth, of course."

"Every man to his choice. Do you remember Chambers, that studious fellow? I'm surprised to see that he's a school medical officer."

"Yes, I'd have thought he'd be a professor of something. As for dear old Runty, who never graced any of the lectures with his attendance, he's a research wallah at some place outside London."

"Well, well! We seem either to have run absolutely true to type or to have become complete paradoxes. By the way, Halifax, what about yourself? Did you not want to be a plastic surgeon, if I remember rightly?"

"Maybe I did, but it didn't work out that way. What about you? You were always keen to be a doctor on one of the Hebrides, weren't you?"

"Yes, I was."

The conversation lapsed. "What's your book?" I half-expected it to be *The Story of Surgery* or something like that. He handed it to me without speaking. *An Introduction to Economics* I read. "That," said Halifax, "seems to put it in a nutshell."

* * *

Many drivers must have experienced fog vertigo while motoring. Giddiness arises while the car is in motion and also on getting out of the car immediately after it has stopped. In both you have an illusion of horizontal displacement in the long axis of the car. While driving it leads to a false idea of speed and even of the direction of movement of the car. On stepping out of the stationary car there is vertigo for a second or so in the opposite direction from the car's motion. It is something like the vertical vertigo I get in a totally enclosed lift and seems to be due to the absence of adequate fixation for the eyes. For instance, I find it does not occur if I can fixate on the rear lights of a car ahead or on street lights.

The absence of adequate stimuli for fixation and the capacity of the brain to organise visual stimuli leads to visual illusions of almost hallucinatory quality when fog is dense but unevenly so. I remember being terrified one night to see a line of tanks advancing across my path out of a dense fog on one side. They disappeared as the car drew nearer and their illusory nature was confirmed. No doubt fatigue also plays a part in this phenomenon, because it can occur at night without fog.

It is difficult to avoid these illusions. A windscreen placed far from the driver makes things worse because the eye focuses on spots and reflections of the car interior rather than the dim contours further away. This can hardly be altered without rebuilding the car. Simpler solutions are to keep the windscreen spotlessly clean, to shade panel lights, and even to paint the facia and controls matt black as some experienced rally-drivers do in order to prevent reflections in the screen. I am told the effect is restful and has a strong functional appeal, but so far my wife has prevented me from attempting it. No doubt summer will be here again before I can convince her that it is worth trying.

* * *

It was the first Saturday in March, the day that summer came to London just nine months late. At 5 P.M. I was about three-quarters through a long clinic which had already lasted three hours. A patient came in. "Lovely weather you are having," he said. "And so are you," I replied, making what I thought was an apt rejoinder. "But I have had to work in it," he retorted.

* * *

Our sanatorium is on the moors, a couple of miles from the nearest little town, and we have a bus to transport the staff. There is a proper bus-stop in the main street where the passengers get on and off. The bus is irreverently known to the townsfolk as the Tubercular Circular.

* * *

St. Cynthia's Hospital, Delphi.—Applications are invited for the post of SENIOR REGISTRAR for general medical duties, including the care of patients. The appointment will be made for a probationary period of 1 year, after which the successful candidate will have charge of beds, and consultant status will follow on the retirement of the present senior physician in 3 years. There will be no opportunities for teaching or unoriginal research.

Applicants should have engaged in active medical practice for more than 8 years, of which at least 6 years should have been spent outside a teaching hospital. The post demands sound clinical judgment, high competence, wide experience, and familiarity with modern medical thought, and possession of the M.R.C.P. is a disadvantage. Canvassing and the submission of references and testimonials will disqualify, and applicants are expected to furnish proof of their abilities. There will be no formal interview but it is incumbent on candidates to call upon each member of the selection committee, composed entirely of the senior medical staff of the hospital. Arrangements may be made through the hospital secretary to ensure that the interviews are completed in the same day. Where it is intended that published work should be taken into consideration, one reprint of each article should be submitted in advance, and such work will be judged on its merit.

Applications (one copy) should reach the Medical Director by 17th March, 1997.

Letters to the Editor

X RAYS AND LEUKÆMIA

SIR,—In our preliminary communication [1] we reported the existence of an association between diagnostic irradiation during pregnancy and later development of leukæmia or cancer in the child. Dr. Reid (Feb. 23) has revived the suggestion that this association might depend simply on a coincidence between two otherwise unrelated facts: (*a*) that primiparæ are more likely than multiparæ to be referred for radiography, and (*b*) that first-born infants may be more liable than others to develop malignant disease during childhood. Our records confirm the truth of both (*a*) and (*b*); hence, Dr. Reid's explanation has a certain prima-facie plausibility. However, as previously reported,[2] a higher incidence of antenatal irradiation is still found among our cases when comparison is restricted to controls of corresponding parity. The case/control contrast is in fact just as great after standardisation for parity (and for the proportion of twin births) as when this factor is ignored. The risk associated with primogeniture and the risk associated with antenatal irradiation are therefore two quite distinct entities.

Dr. Reid is justified in stressing that, on the evidence of our figures, over 90% of the cases of malignant disease in children under 10 years of age (which are in any case rare) must be due to causes other than diagnostic irradiation. It follows that the risk to life associated with irradiation in utero must be small; nevertheless our report has a practical implication if the risk of *not* performing an antenatal X-ray examination is also small.

Two other reasons for exercising greater caution in this matter than Dr. Reid yet feels to be necessary should also be mentioned. In the first place there is the small but inescapable genetic damage to be considered. According to Osborn's estimate [3] just over a quarter of the genetically significant radiation resulting from diagnostic radiology is received by children before they are born. Secondly, it is not safe to assume that the cases of leukæmia and cancer which occur within the first decade of life represent the whole "first generation" cost of exposing fœtuses to X rays. The data on leukæmia following the atomic explosions in Japan do not give "any clear indication that the incidence has yet begun to diminish by the end of the ninth year." [4] In seventeen confirmed cases of malignant disease following irradiation for thymic enlargement the *average* interval between treatment and onset was nine years.[5] Our own data also suggests that the *relative* risk of death from malignant disease for children who are irradiated in utero is as high as ever after eight or nine years even though the *absolute* risk has diminished by these ages.

ALICE STEWART
J. W. WEBB
B. D. GILES
D. HEWITT.

Department of Social Medicine, University of Oxford.

COST OF HOME CARE FOR THE ELDERLY

SIR,—I read with interest your note on this subject (Feb. 23, p. 435). Nearly two years ago the borough treasurer of Reading and I compared the cost to both national and local public funds of maintaining an elderly person in a new bungalow with that of maintaining him in purpose-built part-III accommodation. We postulated two visits per week from a district nurse and a varying number of hours per week from a home help. It became apparent that in such a situation it was cheaper to main-

1. *Lancet*, 1956, ii, 447.
2. *Ibid*, p. 573.
3. Osborn, S. B. *In* Hazards to Man of Nuclear and Allied Radiations. H.M. Stationery Office, 1956; p. 117.
4. *Ibid*, p. 86.
5. Simpson, C. L. et al. *Radiology*, 1955, **64**, 840.

tain an elderly person in the part-III accommodation once he required more than fourteen hours' domestic help per week.

I endorse the hope of the governors of the National Corporation for Old People that further attempts will be made to compare the cost of institutional and domiciliary care of the elderly. This subject grows in importance as more and more old people require help from central or local public funds. There are cogent reasons why the elderly should not be admitted into institutional accommodation, whether hospital or part III, but I wonder whether some people are not assuming too readily that it is cheaper to maintain them outside such accommodation. Unfortunately the issue is often clouded by the distinction between local and central government services.

Medical Officer of Health's Department, Reading. E. HUGHES.

BRONCHIAL CARCINOMA

SIR,—It was with interest that we read Mr. Vernon Thompson's letter (Feb. 23) giving figures to show the time taken to refer cases of bronchial carcinoma to a thoracic surgical unit. As physicians who specialise in diseases of the chest we were surprised at the delay which arose at the chest clinic. This has, therefore, led us to analyse our cases seen at the chest clinic at this hospital during the past three years. They total 75 and can be divided into three groups.

The first is made up of 38 cases where at the first clinical examination bronchial carcinoma was diagnosed but which were judged to be inoperable because of metastases outside the chest or because of poor general condition with, for example, chronic bronchitis and emphysema. Most of these cases were discussed with, and many investigated by, our thoracic surgical colleague. The diagnosis was confirmed in as many cases as possible by bronchoscopy, or gland biopsy, or sputum examination, so that we could speak with certainty to the relatives and plan appropriate treatment with the family doctor.

The second group is made up of 28 cases in which when they were first seen, or shortly afterwards, "probable carcinoma which might be operable" was diagnosed clinically and the patients were immediately referred to a thoracic surgical unit for further investigation and treatment. In this group the surgeon found 15 to be inoperable at bronchoscopy or thoracotomy; resection was possible in the remaining 13.

There is a third group of 9 cases in which the diagnosis was delayed because the development of the carcinoma was masked by various other conditions.

It can be seen from the accompanying table that of 75 cases 59 were diagnosed immediately and a further 7 within six weeks. In 9 cases the diagnosis was delayed. The average time taken for the 28 cases in which the patients were admitted for operative assessment was three weeks, of which investigation at the chest clinic accounted for three days.

ANALYSIS OF CASES OF BRONCHIAL CARCINOMA AT A CHEST CLINIC

—	Delay in diagnosis (weeks)								
	0	1	2	3	4	5	6	>6	Totals
Inoperable on clinical examination	35			1	1	1			38
Inoperable on bronchoscopy or thoracotomy	14						1		15
Resections	10	1	2						13
Delayed diagnosis								9	9
Totals	59	1	2	1	1	1	1	9	75

The third or late-diagnosis group included 3 patients with known tuberculosis in which the average time for diagnosis was three months. A further man was under observation for eleven months on account of a small lesion considered to be tuberculous. This cavitated and tubercle bacilli were reported in his sputum. Since the cavity became appreciably larger, despite three months' chemotherapy, lobectomy was done and a cavitating carcinoma found. A case with bronchitis was observed with a slowly increasing area of infiltration. This was thought to be tuberculous, but after seven months a bronchoscopy showed a squamous-cell carcinoma. Operative treatment was precluded because of bronchitis, but the patient responded well to radiotherapy. It took us nine months to diagnose carcinoma which occurred in a woman who was under treatment by us for acute systemic lupus erythematosus, with pulmonary manifestations (in the press). One case presented as an empyema at the site of a known bronchiectatic lobe, and an underlying carcinoma was not recognised for nine weeks. In an elderly bronchitic man collapse of a lobe developed after he had been under observation for five months; carcinoma was diagnosed clinically, but his general condition did not allow further investigation. In a further, uncomplicated, case diagnosis was delayed for six months, during which time he was seen by locums.

Mr. Thompson, in order to avoid delay, advocates an X-ray service so that general practitioners can refer cases directly to a thoracic surgical unit. In the majority of our last group it is unlikely that this would have happened on the appearances of the initial radiograph.

The adequate recognition of carcinoma of the lung is only a part of the adequate management of chest diseases in general. This can be carried out at chest clinics only if they are staffed by well-trained people and have efficient radiological and laboratory facilities.

There was little or no delay in the diagnosis of most of our cases, yet the number helped by surgery was small. This is because the disease has an insidious onset, tends to occur in elderly patients who are commonly disabled by chronic bronchitis, and is often well advanced by the time the patient attends the chest clinic.

The success of surgery depends mostly on the histological character of the tumour. Many patients with slowly growing tumours, such as squamous-cell carcinoma, do well with surgery despite long histories.

Ashford Hospital, Ashford, Middlesex. P. E. BALDRY
B. GOLBERG.

SIR,—Mr. Thompson analysed 135 cases of lung cancer operated on at the London Hospital in 1954 and found an average delay of 6·4 months between first symptom and attendance at the department of thoracic surgery. He blames chest physicians for much of the delay in diagnosis. Apparently all cases came to him through a chest clinic and not one direct from a general practitioner or general physician. This is unusual and does not obtain in our area. In previously published larger series, a similar delay before operation has been reported. Most of these reports relate to the days before the development of the modern chest clinic, and thus the delay referred to by Mr. Thompson is shared with other physicians, radiologists, and general practitioners.

The prognosis of cancer of the lung paradoxically appears to improve with the delay before operation, and thus careful assessment before surgery and exclusion of other disease is reasonable. In the Midlands, the commonest cause of hæmoptysis is chronic bronchitis. It would be impracticable for a thoracic surgeon to see all cases with this or other symptoms of chest disease which so frequently occur in middle-aged or elderly men.

With the concurrence of thoracic surgeons in this area, some chest physicians bronchoscope possible cases of cancer of the lung within ten days of first consultation. Before this, cytological examination of the sputum will have been made. Consultative sessions between thoracic surgeon and chest physician are regularly held in a chest clinic or thoracic surgical unit, and the patients are operated upon as soon as there is a vacant surgical bed—the total delay is usually rather less than two months.

We suggest that facilities for expert cytological examination of the sputum should be extended. Bronchoscopic examination by either physician or surgeon should be commonplace and widely available. Radiography of

the chest is more important than auditory examination, and we entirely agree that radiographic facilities for general practitioners should be provided. At that stage, it should not be necessary for cases to be filtered through either a physician or a surgeon.

Worcester. E. N. MOYES.
Warwick. P. G. ARBLASTER.

SIR,—Mr. Thompson has rightly castigated the chest physicians for delay in sending patients with bronchial carcinoma to the thoracic surgeon. This indictment must apply not only to the chest physician but also to the bulk of the medical profession.

A normal chest X-ray by no means excludes the presence of bronchial carcinoma; but it is perhaps asking too much either of the radiologist or the general practitioner to discriminate between those patients who should be referred to the thoracic surgeon and those who may safely be discharged from surveillance.

At this clinic it is our normal practice, whether or not the chest X-ray is normal, to investigate in the following manner all patients with hæmoptysis of unknown cause and all patients aged 30 or more who have recently had a localised pulmonary lesion noted on clinical or radiological examination: (1) immediate bronchoscopy and if necessary bronchography; (2) for six months, monthly clinical and radiological review; (3) for three years, clinical and radiological review at three-monthly intervals. We would stress that these investigations are essential even in the presence of a normal chest X-ray. Only if patients are investigated in this way can we hope to diagnose the early bronchial carcinoma.

Baguley Hospital, Manchester. P. F. JONES
T. M. WILSON.

SIR,—Attacks on colleagues such as that made by Mr. Thompson are fortunately rare. However, it is pleasing to find that some thoracic surgeons realise that an operable case of bronchial carcinoma is urgently in need of treatment. Delays in admission to a thoracic surgical unit of upwards of four weeks are common, and we wonder what would happen to the waiting-list if only cases with a doubtful chest radiograph were admitted direct to such units. The main factor in the early diagnosis of bronchial carcinoma is always to keep such a diagnosis in mind. Symptoms commonly precede radiological changes, and the institution of further investigations should not be delayed because radiological examination is negative.

Edgware General Hospital, Middlesex. R. GRENVILLE-MATHERS
H. J. TRENCHARD.

SIR,—Mr. Thompson seems to take an unduly pessimistic view of the work done in the chest clinics in this country.

There must be many chest physicians who, like myself, were trained by him and who are capable not only of diagnosing bronchial carcinoma on clinical and radiological findings, but of proving the diagnosis by bronchoscopy should it be necessary to do so. In spite of this, the sad fact remains that of 16 cases of proved bronchial carcinoma picked up during the first few months of our general-practitioner-referral miniature-radiograph service, none has proved operable. The average delay between miniature radiograph and bronchoscopy has been about three weeks. Is it possible that the publicity campaign in the press is having the opposite of the desired effect?

I have gained the impression that patients who really fear that they have a carcinoma of bronchus are afraid to go to their doctors to have the diagnosis proved, and that in many cases the delay is in the period before reaching the general practitioner.

Croydon Chest Clinic. D. PARADISE.

THE DISINTEGRATIVE ACTION OF THE NERVOUS SYSTEM

SIR,—It has long astonished me to hear it repeatedly stated that modern medicine is "integrative" and "holistic" and that the tendency is for it to become more so, when in fact, exactly the opposite is the case. Medical science in the twentieth century is essentially analytical and disintegrative as progressive specialisation clearly indicates; nor is this to be deprecated, for it is in this very power to isolate and deal with the multiplicity of factors affecting a person's well-being that the power of medicine lies.

The emergence of psychological medicine as an effective force, whatever its philosophical implications, is just another specialty; in practice, another "system" the disorders of which have to be correlated with the rest.

This extraordinary confounding of opposites is, surely, an expression of our revulsion against 19th-century materialism and its consequent tendency to degrade human values. Holistic and similar integrative philosophical systems serve to reassert in our minds the unique intrinsic value of each individual, and hence determine our attitude towards our patients, and our profession. But this, Sir, is Faith. Science is a different matter.

London, S.W.11. J. F. ROBINSON.

UNMARRIED PARENTHOOD

SIR,—It is hardly proper for someone from "a moral agency dabbling with sex" to intervene when one doctor accuses another of unphysiological thinking: every profession has its courtesies. I may, however, perhaps ask Dr. Tuthill (Feb. 23) what he means by morality. Does he assume that "what is moral" means simply "what most people do"? If there were a tendency for more and more swindlers to come before the courts, would that fact make swindling more "moral" than before? If more and more patients die of cancer of the lung, are we to revise our standards of health, and regard that cancer as a normal condition of civilised man?

This pathetic appeal to "changing circumstances and increasing knowledge" as a means of slipping off our obligations is surely discredited by now. This Council is so concerned with accurate knowledge that our workers were able to supply some of the statistics from which this discussion arose: but the statistical method is not the whole of philosophy. There has to be a dogma at the heart of morality—a belief by which peoples or nations determine to live, first because they believe it to be true, secondly because they see that it makes sense of the knowledge they have. The dogma at the heart of Christian sex morality is that coitus is a sacramental act for the expression and enrichment of a partnership to which a man and a woman have committed themselves irrevocably in love, and for the procreation of children within that partnership, and there alone.

This dogma does justice to the wholeness of human nature: we do not regard our bodies as cleverly contrived toys, to be played about with for the sake of thrills; we do not limit our concept of sex to genital activity, nor have we only negative counsel for lovers who have to wait for their marriage. Our dogma, which carries, of course, its own discipline within it, meets the facts of human nature and of human and social need, and its confirmation is amply demonstrated in the history of civilisations as well as in the consulting-rooms of responsible psychiatrists. The facts which appear to have alarmed your correspondents so immoderately arise because our dogma is ignored: they afford no ground for argument that it should be revised.

Without this dogma, in fact, sex becomes like an organ enlarged, a faculty uncoördinated with the rest

of personality; men and women are tantalised, then cheated of that which they most hope for; children suffer the injustice of being born unwanted or without a natural home; women are exploited—in the long run, the woman pays most in societies which loosen sexual morality, and society itself drifts into those very barbaric and subhuman notions which seem to underlie Dr. Tuthill's letter—that sex is but an appetite analogous to that behind eating and drinking; that the "tragedy" of the unmarried mother is not "very serious" while the adoption societies cannot meet the demand for all the babies which she can produce (an interesting variant, by the way, from the attitude of your other correspondents for whom the illegitimate child appeared to be the *only* tragedy in premarital intercourse)!

A healthy society is not ashamed to affirm the basic principles by which it lives. What we want, do, and are depends on what we believe.

Church of England Moral Welfare Council,
Church House, Dean's Yard,
London, S.W.1. ENA M. STEEL
General Secretary.

PEDICULOSIS CAPITIS

SIR,—As one who looked after the fate of a large part of Dublin's louse population in dermatological practice during six years, I was interested in the findings of Dr. Nelson and Mr. Cromie (Feb. 23) in regard to the superiority of 'Esoderm' over other remedies for pediculosis capitis. As they note, by far the most important aspect of this condition is the frequency of reinfestation. Of my last 500 hospital cases, 20% suffered from pediculosis capitis (apart from any other skin disease) and of these about a third (7%) had become reinfested.

The head louse is common among poor families in Dublin and, as a great many of them cannot afford shampoos, a cleansing agent such as esoderm would be extremely useful. But the problem is obviously one to be dealt with principally by improving living conditions, and by education in hygiene, and will not be solved by insecticides. The idea, therefore, that the nursing staff of the school and public-health services should be one is excellent.

I may add that it is well recognised that, in young patients from the poor areas of Dublin, dandruff is nearly always mechanised.

London, W.1. BETHEL SOLOMONS.

TOWARDS PREVENTING SUICIDE

SIR,—I was most interested in the letters published in your columns relating to the detection and prevention of would-be suicides.

It has long been a theory of mine that many suicides could be prevented by the creation of a society on similar lines to Alcoholics Anonymous.

That is to say, a permanent service would have to be established which would be prepared to accept calls from any person who was desperate and seeking help. In many cases suicide would be prevented if the would-be suicide could find a sympathetic listener and counsellor who would listen to all his troubles and give him assistance and encouragement. Once it became generally known that such advice and help were forthcoming and would-be suicides were urged to get in touch with the society and to suspend any drastic action at least until a member of the society should have time to call on them within the next 24 hours, I believe the psychological effect—even if only a natural curiosity to know how the counsellor would react to the problem—would cause them to hesitate. Of course it would be essential that such a service should be a night-and-day service, with an easy telephone number to memorise, and voluntary helpers in all the larger towns. Such helpers should not belong to medical or religious bodies, nor should they be trained social workers or psychiatrists, but simply men and women who have themselves known troubles and overcome them and who have both experience and understanding. Preferably, of course, the root cause of the trouble should be ascertained before sending the counsellor (in such general terms as ill health, money matters, business, love affair) so that a person could be chosen to help who had overcome a similar problem in the past.

Could not such a scheme be started under the auspices of some interested organisation?

Paris. A. WATNEY.

OLD PEOPLE IN HOSPITAL

SIR,—I am sure everyone will agree with Dr. Trevor Howell's remark last week that there is frequently a social problem behind the admission of elderly patients to hospital. Solving this problem is usually difficult, but not impossible: a proportion, however, remain insoluble, at least to me. It is these patients, or rather ex-patients, who constitute the more or less permanent residents to whom Dr. Rang refers (Feb. 23).

Of the 32 beds available (only 26 were filled at the time of Dr. Rang's experiment) over 20 are filled with elderly persons suffering from a profound disability which does not, however, require skilled nursing care. They have no relatives, or none willing or able to take care of them, while the local authority either considers their disability too severe for admission to a welfare home or pleads lack of accommodation. Failing a more generous interpretation of the meaning of Section 21 of the National Assistance Act that "it shall be the duty of every local authority . . . to provide accommodation for persons who by reason of age, infirmity or any other circumstances are in need of care and attention which is not otherwise available to them" or the provision of more such accommodation by the local authority, it is difficult to see how this anomaly can ever be remedied.

London, S.W.1. AMULREE.

POLYNEURITIS AS A CAUSE OF "AMYOTONIA CONGENITA"

SIR,—Dr. Chambers and Dr. MacDermot have rendered a signal service in delineating (Feb. 23) the diagnostic features of infantile polyneuritis. Less praiseworthy, in my opinion, is their choice of heading. They clearly regard amyotonia congenita as a miscellaneous group of conditions, having in common only their occurrence in infancy or early childhood and the generalised hypotonia exhibited by those affected. This is a distortion of Oppenheim's original concept and obscures the very real advance which his contribution provided,

This consisted in drawing attention to a condition of generalised muscular hypotonia in infants, dating from birth and showing a tendency to gradual improvement. Oppenheim believed it was a disease-entity and due to delayed development of the muscles including their innervation. He anticipated, therefore, that the muscles would appear normal on orthodox histological examination. Much of the confusion over the nature of this condition is the result of other conditions, now better defined and more easily recognised, having been incorrectly diagnosed as amyotonia congenita. I am particularly referring to cases of Werdnig-Hoffmann disease, of congenital or intra-uterine onset, being mistakenly diagnosed as amyotonia congenita. If there do, in fact, exist *formes frustes* of Werdnig-Hoffmann disease, as suggested by Arthuis,[1] muscle biopsy may be required to make the correct diagnosis. In infantile polyneuritis, as Chambers and MacDermot so usefully point out, an elevated protein content in the cerebrospinal fluid may be sufficient to make the diagnosis clear.

It is quite possible that Oppenheim himself wrongly diagnosed as amyotonia congenita infants with one of these other conditions. No-one is infallible. Nevertheless, the fact remains that there is a small group of infants who show all the clinical features of amyotonia congenita, as described by Oppenheim,[2] including congenital onset and tendency to improvement, and also yield muscle biopsies entirely free from abnormality

1. Arthuis, M. L'amyotrophie spinale infantile de Werdnig-Hoffmann. Paris, 1954.
2. Oppenheim, H. *Mschr. Psychiat. Neurol.* 1900, **8**, 232.

of the muscle-fibres (6 cases recently reported by Walton [3] under the heading of benign congenital hypotonia) and with completely normal intramuscular nerve-endings [4] or at the most an appearance of immaturity.[5]

These cases may in time be shown to have more than one ætiology, but as long as there remain obscure cases of congenital hypotonia with normal muscle histology and favourable outcome, the application of the term amyotonia congenita is still appropriate. To give new names to these cases (e.g., essential and primary hypotonia of young infants,[6] delays in the appearance of tone,[1] benign congenital hypotonia[2]) is not to throw new light on their essential nature, but merely gives the uninitiated reader the impression that new diseases have been described.

I would therefore submit that a more suitable title for this otherwise excellent paper would have been "infantile polyneuritis simulating amyotonia congenita."

Midland Centre for Neurosurgery, Smethwick. A. L. WOOLF.

PROTECTION OF TESTES IN DIAGNOSTIC RADIOLOGY

SIR,—In an annotation last week you refer to the need to reduce the radiation dose administered by diagnostic methods without diminishing their efficiency.

Most diagnostic X-ray departments do not seem to take any special precautions to protect the testes from irradiation when films are taken of the pelvis or neighbouring organs. Though the genetic risk from such exposure is small,[7] it could be diminished greatly by shielding the testes as a routine. This should not present undue technical difficulty; it seems unreasonable to wait for evidence to show just how much genetic damage can be done by low-dose irradiation of human testes.

Department of Therapeutics, St. Thomas's Hospital Medical School, London, S.E.1. ANDREW HERXHEIMER.

RHEUMATOID ARTHRITIS WITH CHRONIC LEG ULCERATION

SIR,—I fear that Dr. Allison and Dr. Ray Bettley (Feb. 9) have drawn quite unjustifiable conclusions from their failure to heal chronic leg ulcers in rheumatoid patients. In the past three years I have seen four cases similar to those cited by them. The record of the fourth patient, at present under treatment, is as follows:

A housewife, then aged 30, began to have rheumatoid arthritis in 1920. After seven years' anti-rheumatoid treatment an ulcer appeared on her right leg. This did not heal until fifteen years later—and then only when she had been in bed after the removal of a stone from her right kidney. Her rheumatoid arthritis steadily increased in severity, and in 1948 she was further crippled by an ulcer on the left leg (the right meanwhile remaining completely healed). In the past eight years she has had no less than four unsuccessful skin grafts, interspersed with numerous long periods of bed rest in hospital. Eventually the ulcer encroached on two-thirds of the circumference of the leg above the ankle; at this stage amputation was advised—and refused.

When she came under my care, twenty weeks ago, her ulcer measured 270 sq. cm. in area (18 × 15 cm.). She was (and still is) very severely deformed by rheumatoid arthritis, with virtually no free ankle movement. She had reached the stage of walking almost on hands and feet, using the backs of her proximal phalanges as forepaws. This was so obviously a chronic ulcer resulting from venous stasis, consequent on loss of lower-limb muscular activity, that a confident prognosis could be given immediately and she was ordered to bed—despite her protests that this had been tried many times before (as with the Middlesex cases). After two weeks of this régime the ulcer measured 180 sq. cm.; after six weeks, 100 sq. cm.; after twelve weeks 21 sq. cm.; after sixteen weeks 10 sq. cm. At present it is 4 sq. cm. in area and I expect it to be soundly healed in six weeks.

Why should this be so when previous bed rest had proved so unsuccessful? The answer is quite simple—it was not bed rest in the hospital sense of the term.

When a patient is put to bed, as treatment for an ulcerated leg, everyone imagines that the aim is to rest the leg—hence the term "bed rest." This is a complete misconception, for this mode of therapy should involve an *active* process—namely, promoting venous return and thus abolishing the interstitial-tissue œdema which is preventing healing. A patient who is allowed to wander in and out of bed from time to time is not doing this. A patient sitting up in bed, even if she never gets out of it, is doing her ulcer about as much good as by standing in a queue. The only way to promote venous return in bed is to have the patient lying flat (one pillow for the head) and the foot of the bed raised at least 9 inches; for it is only then that the heart level is below that of the leg, the peripheral veins cease to be distended, and the venous pressure becomes consistently negative.

I suggest that the diagnosis of lupus erythematosus cannot yet be sustained in the cases described by Dr. Allison and Dr. Bettley.

London Varicose Clinic, S.W.11. STANLEY RIVLIN.

ANTI-HISTAMINE DRUGS IN CHOLERA

SIR,—In 1952 I described the prevention and cure of uræmia in cholera, by means of intravenous administration of vitamin C and intramuscular injection of an anti-histamine drug in the kidney region.[1]

In the epidemic of 1954 three anti-histamine drugs were administered separately without vitamin C. (Previously vitamin C alone had failed to start urination in 30% of uræmic cases.[1])

The anti-histamine drugs tested were: (1) mepyramine maleate ('Anthisan'), 2 ml. of 2·5% solution; (2) chlorpromazine hydrochloride ('Largactil'), 12·5 mg. in 6 cases and 6 mg. in 5 cases; and (3) promethazine hydrochloride ('Phenergan'), 2 ml. of 2·5% solution. 55 culture-positive cases of cholera with established uræmia were studied.

Mepyramine failed to start urination in 3 of 11 cases (27%); chlorpromazine failed in 2 of 11 cases (18%); promethazine failed in 1 of 17 cases (6%). In 16 control group cases there was no urination in 4 (25%).

Thus the group treated with mepyramine (given alone) fared no better than the controls. Chlorpromazine possibly gave slightly better results; but it was found to have a special drawback in cholera, causing a dangerous depression of blood-pressure. By contrast promethazine seemed to be of definite help, and its administration led to no untoward reactions.

We made extensive trials of combined treatment with vitamin C and promethazine in the severe cholera epidemics of 1955 and 1956.

In all cases where urination did not occur within two hours after infusion of saline solution, promethazine was given intramuscularly in the kidney region. Patients who did not urinate within the following eight hours were given vitamin C 500 mg. intravenously. In a few cases administration of both the anti-histamine drug and the vitamin C had to be repeated every twelve hours.

Since 1954, as was then anticipated, there has not been a single uræmic death in my ward. In 1955 and 1956 cases of cholera treated here numbered 1610 and 1178, and the corresponding mortality-rates were 7% and 4·7%. This is in sharp contrast to the figures for Calcutta as a whole (elsewhere in the city treatment is by saline infusions only), the figures for 1955 and 1956 being 32% and 36·5%.[2]

3. Walton, J. N. *Lancet*, 1956, i, 1023.
4. Woolf, A. L. *Proc. R. Soc. Med.* (in the press).
5. Coërs, C., Pelc, S. *Acta neurol. belg.* 1954, **54**, 166.
6. Sobel, J. *Med. J. Rec.* 1926, **124**, 358.
7. The Hazards to Man of Nuclear and Allied Radiations. H.M. Stationery Office, 1956; paras. 255, 260; appendix K, table 2.

1. Chatterjee, H. N. *Lancet*, 1952, ii, 90.
2. Chatterjee, H. N. Proceedings of Indian Science Congress, 43rd Session, Agra, Calcutta, 1956; part 3, p. 338.

I should like again to emphasise that the acute renal changes in cholera are non-inflammatory and non-proliferative.[3] These changes, which are temporary and completely reversible,[3] are quite unlike those found in other forms of acute and subacute nephritis.

Infectious Diseases Ward,
Chittaranjan Hospital,
Entally, Calcutta. HEMENDRA NATH CHATTERJEE.

DISCREPANCIES IN THE ERYTHROCYTE-SEDIMENTATION TEST

SIR,—The explanation quoted by Dr. Groen (Feb. 23) is not applicable to the discrepancies in the E.S.R. test we described (Feb. 2). This is made clear in the last two paragraphs under the subheading "Results." We have now seen discrepancies (arithmetical difference between duplicates) in citrated blood of 40 mm., 26 mm., and 18 mm., in addition to less serious ones.

We regret that we did not refer to the valuable paper by Ström.[4] Our article, however, was primarily concerned with the frequency and possible clinical significance of the discrepancies in rheumatic fever.

Clinical Chemotherapeutic Research Unit,
Western Infirmary, Glasgow, W.1. W. D. ALEXANDER
M. M. ANDREWS.

EFFECT OF UNABSORBED RADIOGRAPHIC CONTRAST MEDIA ON THE CENTRAL NERVOUS SYSTEM

SIR,—Mr. F. L. Davies[5] has detailed the adverse effects of unabsorbed contrast media in the subarachnoid space. He emphasises the desirability of removing as much of the oil as possible after myelography or during operation.

He is particularly concerned with "diminishing the chances of the substance entering the cranial cavity." Since this is most likely to occur after cervical myelography, I wish to draw attention to the technique of this examination I have described,[6] which prevents the flow of oil through the foramen magnum, no matter how extreme the degree of Trendelenburg position employed. The principle consists in the maintenance of hyper-extension at the atlanto-occipital joint throughout the examination.

Department of Radiology,
Government Hospital,
Tel-Hashomer, Israel. F. DALITH.

MUNCHAUSEN'S SYNDROME

SIR,—The following case of this condition may be recognised by some of your readers:

A red-haired cook or post-office worker, aged 44, appears in the casualty department with a history of increasing headaches, vomiting, drowsiness, and rapidly deteriorating vision. The optic discs show changes that, to the uninitiated, appear sometimes to be those of optic atrophy, and at others those of bilateral papilloedema; the visual fields are grossly constricted. She is very obese and states that she has been gaining weight rapidly, and she is usually somewhat reluctant to come into hospital.

X-rays of the skull show two round burr-holes in the anterior frontal region: the history she gives to account for these is that she had an accident some years ago, and "a clot of blood" was removed from the brain. She also has a much-scarred abdomen with a discharging sinus, alleged to be due to an old tuberculous peritonitis.

When surgical measures to relieve the increased intracranial pressure are suggested, she discharges herself from hospital, but discharge can be achieved more rapidly by confronting her with her previous admissions to hospital. I have seen her twice at this hospital, and also twice at Mile End Hospital, and a casualty officer there recognised her as having attended his old hospital, Charing Cross. She has also been in Hillingdon Hospital. The frontal burr-holes for prefrontal leucotomy were, I believe, made at a hospital near London. Obesity is an occasional complication of this operation, as well as an occupational hazard of cooks. The fundal changes are those of opaque nerve-fibres which almost surround the disc on both sides and make the patient instantly recognisable.

St. Bartholomew's Hospital,
London, E.C.1. K. W. G. HEATHFIELD.

DRINKING SEA-WATER

SIR,—Three men were rescued a short time ago after drifting for six days on a raft in the Mediterranean. They are reported to have followed the "Bombard system" and drunk measured amounts of sea-water, as they had no fresh water.[1] Their story has naturally received considerable publicity, and the inference is usually drawn that they survived because they drank sea-water. I believe they were lucky to survive in spite of it, and, in view of the importance of this question to future castaways, I should like to present the results of some calculations I have made.

From the point of view of a castaway the important question is whether drinking sea-water increases or decreases the time he can survive without fresh water. A direct experimental answer to this obviously cannot be obtained for man; all one can do is to attempt to calculate from experimental data how nearly a lethal point has been approached. (A study of mortality in lifeboats after sinkings during the late war[2,3] does, however, provide a very convincing "natural experiment.")

Suppose first that the men had not drunk sea-water. In a climate such as that over the Mediterranean, which is a favourable one for survival as it is neither cold enough to cause death from cold nor hot enough to cause sweating, an inactive man without food or water loses about 1·3 litres of body-water a day.[4] This comes to 7·8 litres in six days, or 11% of an average body-weight. This loss might incapacitate a man, but it is well inside lethal limits. Adolph and his associates[5] considered a loss equal to 20% of the body's weight, incurred rapidly in the desert, likely to cause death; more severe dehydration can probably be tolerated if the loss takes place slowly. So far as death from dehydration is concerned, it appears that if the men had not drunk sea-water they should have been able to survive for about twice the time they actually were adrift. Further calculation based on the excretion of electrolytes by fasting and dehydrated men[6] shows that in six days the osmolar concentration of their body-fluids would have risen by 10%.

The castaways are stated to have drunk 3 tablespoonfuls of sea-water every two hours from 6 A.M. till 8 P.M., which amounts to 12 fluid ounces a day. The salinity of the Mediterranean is 3·7–3·8%,[7] and so in six days they would have taken in 2 litres of water and 2600 milliosmols of electrolytes, predominantly sodium chloride. If this had been retained in the body, the overall water balance would have been improved by 2 litres, but the osmolar concentration of the fluids of the body would have risen to 28% above normal. Furthermore, sodium is largely confined to the extracellular space; and this would be expanded, at the expense of cell-water, which would be depleted by a third of its volume. The available experimental data[6,8,9] suggest that, after the first day of drinking sea-water, increasing amounts of the ingested salt are excreted, at the cost of body-water. Calculation based on the salt excretion and urine volumes found experimentally suggests that at the end of six days the concentration of the men's body-fluids would have been 24% above normal. Their overall water balance would be about the same as if they had not drunk sea-water, but their cells would have lost proportionately twice as much water as their extracellular fluids. Death can probably be caused by severe hypertonicity alone, or by severe loss of cell-water, or by

1. *Times*, Feb. 5, 1957.
2. McCance, R. A., Crosfill, J. W. L., Ungley, C. C., Widdowson, E. M. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1956, no. 291.
3. *Lancet*, 1956, ii, 879.
4. Hervey, G. R., McCance, R. A. *Proc. nutr. Soc.* 1954, **13**, 41.
5. Adolph, E. F., et al. Physiology of Man in the Desert. New York, 1947.
6. Hervey, G. R., McCance, R. A. *Proc. roy. Soc.* B, 1952, **139**, 527.
7. Harvey, H. W. Recent Advances in the Chemistry and Biology of Sea Water. Cambridge, 1945.
8. Ladell, W. S. S. *Lancet*, 1943, ii, 441.
9. Whillans, M. G., Smith, G. F. M. *Canad. J. Res.* (*E*), 1948, **26**, 250.

3. Chatterjee, H. N. *Trans. R. Soc. trop. Med. Hyg.*, 1941, **34**, 333.
4. Ström, J. *Acta. med. scand.* 1938, **96**, 365.
5. Davies, F. L. *Lancet*, 1956, ii, 747.
6. Dalith, F. *Radiol. clin.* 1956, **25**, 212.

a combination of lesser degrees of both changes.[10–12] The combination calculated is probably not far short of a lethal level, and it is certainly worse than if the sea-water had not been drunk. Furthermore, the rate at which water was being lost in the urine would be increasing, and at any later time even the overall balance of water would be worse than if sea-water had not been drunk.

Theory thus suggests that, although survival for six days is not incompatible with the amount of sea-water these men drank, it is unlikely that they could have survived for much more than a day or so longer, as compared with the several days possible if they had not drunk sea-water. Even if drinking sea-water does lead to increased well-being in the early stages, all the evidence is that its late effects are disastrous. Castaways cannot know the duration of the "experiment" in advance, and they should on no account drink sea-water.

Medical Research Council Department of Experimental Medicine, Cambridge. G. R. HERVEY.

NEONATAL COLD INJURY

SIR,—Dr. J. W. Farquhar mentions (Feb. 16) some grave dangers of warming by short-wave diathermy. If he wants to warm cold babies, internal warming by the Khalil/Mac Keith intragastric balloon[13–15] is safe and simple. The logic of the method is supported by the work of Andjus,[16] Parkes,[17] and others.

Keats' House, Guy's Hospital, London, S.E.1. PAUL E. POLANI.

GOVERNMENT AND PROFESSION

SIR,—Your excellent editorial last week suffers from two main defects. One is a defect of memory: on previous occasions the threat of mass withdrawal has been effective and has not harmed the profession, so the argument that it is an alien procedure falls to the ground. The other is that the idea you put forward in its place—of individual resignation—is perfect, except for the fact that terms of service and remuneration are negotiated centrally, and not individually, and that individual resignations are therefore of no value.

What is more serious is the way in which you attempt to rally the "fainthearts" and give them justification for not following their colleagues.

I know *The Lancet* tries to be objective and fair. Unfortunately the profession faces a situation where "reason" is not likely to be triumphant. It is the most serious situation the profession has ever had to face. Literally it is that we must stand absolutely united and meet force with force or perish. It grieves me that the editor of a responsible medical journal should not realise what the issues are.

Two (or is it three ?) wars ago I sat in the fastness of G.H.Q. in an administrative post. I set myself two maxims: (*a*) my colleague—who is also a doctor—at the scene of operations knows the right answer and it is my duty to help him to get what he needs; (*b*) the Government is always wrong. Those same maxims hold true today.

London, W.C.1. J. L. MCCALLUM.

SIR,—Your leading article last week suggests that, rather than a complete withdrawal from the National Health Service, only those general practitioners who are dissatisfied with their lot should resign.

From the press and other reports, it would seem that the majority of doctors are dissatisfied with the present scale of remuneration, but, come what may, they have guaranteed that their patients will not suffer as a result of whatever action they may take.

The public has now become used to a service from which it can obtain free medical attention and advice, and drugs at a nominal cost. A return to private practice on the part of their doctor would merely send them along to a neighbouring practitioner remaining in the service.

This is especially true in the poorer urban areas—in which many dissatisfied doctors practise—where the patients might find it difficult to find the money for consultations and visits and impossible to pay for the new and expensive drugs which have been produced since July 5, 1948.

The matter is an economic one; it is political only in that our pay comes from Treasury sources. Should present conditions continue, the standard of medical practice can only deteriorate.

Liverpool. MERVYN GOODMAN.

"DOCTOR"

SIR,—There are good reasons for patients using the title of doctor when describing physicians and surgeons who may not hold a university doctorate degree, and at the present time it is well to remember them. Past generations of general practitioners, as well as our surviving elders, have been the only freely accessible men with a higher education and integrity. Because of this, patients brought problems, demanding time, sometimes expense, and always wisdom, that were far removed from medicine or surgery. They were, and sometimes are still, too uncomfortable in the company of the priest, too frightened of the police, and too timid to consult their headmasters. Politicians might be hard to trust; the lawyers they could not afford. Their doctors were on their side, and patients found that doctors would care for them and their problems without thought for themselves.

I believe this to be true especially in this country, and perhaps it is a pity that in this country the qualifying degree is not a doctorate in medicine. It might remind us of our heritage and assure patients who might be disturbed in changing times.

We need to be reminded that our profession is concerned with an ideal rather than materialistic way of life. It is a service. However excellent our auxiliary help, we must preserve our right to attend confinements of our patients, to vaccinate and inoculate those whose parents wish us to do it, and to attend old people and report our own cases to geriatric centres. So to those who say that family doctors will not provide for geriatric clinics, clinics for school-children, and infants and maternity patients unless they are paid extra for doing so, we must reply that all these are being done now without this extra payment.

Does the public connect with the title of doctor a code of ethics and a sense of service beyond which might be considered reasonable by a physician and surgeon ? This is important, because to disillusion the public in this would bring discredit. It behoves the public and each of us to have the faith that doctors have the highest standard of service and code of behaviour. To lose this and receive badly needed financial assistance will be no victory. Doctors do not strike.

London, E.17. JAMES H. S. MORGAN.

FRACTURES OF FEMUR DURING E.C.T.

Mr. H. D. W. POWELL (Salford Royal Hospital, Salford 3), writes:

I am interested in the orthopædic problems of simultaneous bilateral fractures of the femoral neck, sustained during convulsive therapy. I should be grateful if anyone who knows of such cases would kindly let me have details of them.

10. Elkinton, J. R., Taffel, M. *J. clin. Invest.* 1942, **21**, 787.
11. Winkler, A. W., Elkinton, J. R., Hopper, J. jun., Hoff, H. E. *Ibid*, 1944, **23**, 103.
12. Elkinton, J. R., Winkler, A. W. *War Med.* 1944, **6**, 241.
13. Khalil, H. H., Mac Keith, R. C. *Brit. med. J.* 1954, ii, 734.
14. Khalil, H. H. *Proc. R. Soc. Med.* 1957, **50**, 78.
15. Khalil, H. H. *Lancet*, Jan. 26, 1957, p. 185.
16. Andjus, R. Cited by Billingham, R. E. *Penguin New Biology*, 1955, **18**, 73.
17. Parkes, A. S. See Billingham, R. E. *Loc. cit.*

Parliament

Royal Commission on Remuneration

ON Feb. 28 the Prime Minister announced that this commission would have the following terms of reference:

To consider (*a*) How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations;

(*b*) What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;

(*c*) Whether, and if so what, arrangements should be made to keep that remuneration under review; and to make recommendations.

He could not fix a date by which the commission must report but he would certainly urge the chairman to proceed without delay.

Mr. JOHN RANKIN: Is the Prime Minister aware that a B.M.A. spokesman quoted in the press said that his reference to an interim adjustment is extremely obscure, and that it might mean any of a number of things, some of which would be entirely unacceptable? Will the right hon. Gentleman not make his attitude on the interim adjustment clear beyond a peradventure, or does he wish to give the tough boys in the B.M.A. the ammunition necessary to destroy the Health Service? The PRIME MINISTER: The sentence which I put into that letter means exactly what it says, and I do not wish to make any interpretation of it this afternoon. At the same time, we are always in touch with the leading members of the profession, and either my right hon. Friend or I will be very willing to make any further explanation at an appropriate moment.

Mr. FRANK BESWICK: Is the Prime Minister aware that if, as the result of any uncertainty as to the meaning of the phrase "interim adjustment," any damage is done to the Health Service the people of this country will not forgive him? Can he say why he cannot make it quite clear, both to allay apprehension on the part of doctors and also in fairness to those who may be invited to serve on this commission, that the commission is not now intended, as was originally the case, simply to dodge the issue, and does not preclude any interim negotiations upon salary-scales? The PRIME MINISTER: The hon. Member is very fond of making statements for which he has very little ground. He prefers to rely rather upon innuendo than fact. The commission was never intended for the purpose of dodging this issue. Members on both sides of the House know the very difficult circumstances that surround some of these problems. I am convinced that the commission will be able to act rapidly and effectively, and I am very hopeful that we shall reach a good point of view between all concerned in this matter.

Dr. EDITH SUMMERSKILL: Will not the Prime Minister say whether the terms of reference which he has mentioned will enable the commission to take into account the conversations conducted at the inception of the service between the Government and the doctors? Further, will he again consider interpreting this phrase, because the attitude of the profession during the next few months may be guided by what he says now? The PRIME MINISTER: On the first point raised by the right hon. Lady, I have not the record of these conversations with me at the moment. Therefore, if she pressed me upon the matter, I should have to ask for notice. I think it would be a matter for the commission itself to decide. With regard to the right hon. Lady's second point, I should prefer to leave the matter as it is at the moment. I feel quite certain that we shall be able to make good progress in this affair.

Mr. MARCUS LIPTON asked the Prime Minister what communications he had received from medical organisations since his announcement of a Royal Commission on doctors' pay. The PRIME MINISTER replied: I have received a letter from the Negotiating Committee of the medical profession, which has been published together with a copy of my reply. Mr. LIPTON: Is the Prime Minister aware that if he has another look at his reply he will see that the English is bad and the meaning obscure? Will he say why he is so curiously unwilling to say whether this proposed interim adjustment may also apply to general practitioners? The PRIME MINISTER: I am sorry about the English. I am always ready to take advice from a very expert source. I think the best thing I can do is to try to get the commission started, and I hope, with great confidence, that we shall be able to clear up the other issues as we go along.

Mr. E. G. FLETCHER: Will not the Prime Minister agree that, whatever may be the case for a Royal Commission to examine the overall question of doctors' pay, there is a strong case for some immediate interim adjustment of doctors' remuneration, and will he acknowledge that and remove all the misunderstanding by making his position clear? The PRIME MINISTER: Yes, Sir. For that reason, I made reference to it in my letter. Mr. ARTHUR BLENKINSOP: Will not the Prime Minister agree that, as he has made this specific reference in his letter to the British Medical Association, it is highly desirable that he should clarify it so that further dispute may be avoided? The PRIME MINISTER: No, Sir. I think that all this will move along satisfactorily. The first thing to do is to get the commission appointed, which I am very hopeful will be quite soon. What I have said in answer to supplementary questions has made it quite clear that my right hon. Friend or I are very ready to take up these further questions with the Negotiating Committee.

Mr. G. S. LINDGREN: In view of the Prime Minister's intervention in this industrial dispute, will he also recommend to industry generally that it should give an interim award on outstanding pay-claims?

Lung Cancer and Smoking

Speaking on the motion for the adjournment on March 1, Mr. MARCUS LIPTON said that there was now statistically an incontrovertible association between cigarette smoking and lung cancer and asked the Government what they were doing to let the people know about this disturbing fact. He realised that in raising this matter he was confronted with formidable difficulties. £880 million a year was spent on tobacco. Out of every £1 spent in the shops, 2*s*. 6*d*. was spent on tobacco and each adult incurred an average expenditure of 9*s*. 4*d*. a week. Four million places were licensed for its sale, and the yield from duty produced £668 million in the last financial year, a record figure.

Mr. Lipton went on to recapitulate Ministerial pronouncements on the subject from Feb. 12, 1954—"I accept the Committee's view that the statistical evidence points to smoking as a factor in lung cancer"—to the latest of Feb. 25, 1957—"I propose to ensure that the public are kept informed of all relevant information as and when it becomes available." So far the Minister of Health had refused to accept the advice of his Standing Advisory Medical Committee that effective steps should be taken to make the facts known to the public and to counteract propaganda in favour of smoking. Mr. Lipton thought that it would be a grave dereliction of responsibility on the part of the Minister and the present Government if they deliberately continued to blind themselves to the seriousness of the situation and refused to take further action immediately. He asked the Government not to shelter behind a stale and outworn formula but to do the job for which the Ministry of Health was appointed and paid—to protect and improve the health of the people.

Mr. RICHARD FORT, a lay member of the Medical Research Council, suggested that Mr. Lipton had seemed more concerned with scoring cheap points off the tobacco companies and the Government than with considering one of the more complicated medical problems of our time. He had failed to emphasise that the kind of work needed to find out the reasons for the statistical facts was very complicated and difficult scientific work. Three points on which much more work was needed were: (1) statistical analysis; (2) the effect on animals of the products from burning tobacco; and (3) the complex problems connected with smoking, air-pollution, chronic bronchitis, and lung cancer.

Mr. J. K. VAUGHAN-MORGAN, parliamentary secretary to the Ministry of Health, said that the Government had

not hesitated to announce to the public any discovery as and when it became available. But though we must give full publicity to the knowledge which was available, we must not indulge in any form of sensationalism. Carefully controlled inquiries had shown statistically that smokers had a significantly higher mortality-rate from lung cancer than have non-smokers. The figure increased in direct proportion to the amount smoked, until among life-long heavy smokers, who may be defined as those smoking about 25 cigarettes a day, it appeared that about one in ten can be expected to die of lung cancer before the age of 75. Among heavy and continuous smokers of cigarettes—that is, those smoking substantially more than 25 a day—the death-rate from lung cancer was about forty times that among non-smokers. The rates among pipe-smokers for the same amount of tobacco smoked were less than among cigarette-smokers. Those who had given up smoking had significantly lower rates than those who had continued to smoke.

There were many ways of interpreting the statistical evidence and it was difficult to reduce the evidence to average figures, but without doubt these findings constituted prima-facie statistical evidence that smoking carried a risk of lung cancer in human beings. But we must view this mortality-rate and these risks with a due sense of proportion. Of a total of 518,000 deaths in England and Wales in 1955, 17,000 were due to lung cancer out of a total of 91,000 for all forms of cancer. That 17,000 compared with 28,000 for bronchitis and 70,000 for coronary disease and angina, apart from other forms of heart-disease. Lung cancer was not our only problem, nor must it be our only preoccupation; nor should we give it any more priority than the figures justify. Nevertheless, it was undoubtedly the case that the lung cancer figures continued to show a steady increase, which had varied from 5·7 to 8·2% per annum over the past five years.

The Medical Research Council was engaged in research on the relationship between smoking and lung cancer, the long-term aim being to identify those constituents of tobacco smoke which might be active in producing cancer. There had recently been built a laboratory at Exeter for fundamental work on the chemical analysis of tobacco, which was the first fruits of the grant of a quarter of a million pounds from the tobacco companies of this country. Research was also going on in hospitals and universities all over the country.

The Medical Research Council was currently reviewing the existing evidence, and its considered views should be available before long. The Government would give those views their full and urgent consideration and he reiterated the pledge that the public would be informed of all the evidence as it becomes available. A pamphlet, lately issued by the Ministry of Education, gave considered and helpful advice on the subject. It was the firm intention of the Government to reveal the truth as it came to light, but we must avoid any unnecessary sensationalism on this very difficult subject.

During much of the debate about half a dozen members were present.

Paying for an Ambulance

On March 1 Sir FRANK MARKHAM moved the second reading of the National Health Service (Amendment) Bill, a measure which is more circumscribed than its title suggests. The Bill gives effect to a recommendation of the Guillebaud Committee by permitting local authorities to provide ambulances on a repayment basis for purposes outside the National Health Service Act. The purposes which the Guillebaud Committee had chiefly in mind were large public gatherings, such as race meetings or football matches. The promoters are willing to pay the local authorities for providing an ambulance service, but at present the local authorities are not able to provide it. Sir Frank gave an assurance that it was not the intention that this Bill should be the thin end of the wedge for making other payments for ambulance services necessary. Mr. VAUGHAN-MORGAN speaking for the Government at the end of the debate reiterated this assurance. The measure, he added, would permit the local authorities to provide a stand-by service; at present, strictly speaking, they could provide an ambulance only after the event. He thought that the proposal might also be useful to some industrial undertakings, such as the National Coal Board, who had by law to provide an ambulance service for their employees. The Bill was read a second time.

QUESTION TIME

Remuneration of Junior Hospital Staff

Mr. A. BLENKINSOP asked the Minister of Health whether he would reopen negotiations with the medical profession for an interim settlement of their claim, pending the full review to be undertaken by a Royal Commission.—Mr. DENNIS VOSPER replied: I am glad to be able to say that the Government are prepared immediately to recommend the management side of the appropriate Whitley Council to offer to negotiate an interim increase in the remuneration of hospital medical and dental staff up to and including the grade of senior registrar. Mr. BLENKINSOP: Does not the Minister recognise that his answer is merely a stonewalling answer? When will he give us some information with regard to the interim negotiations in respect of general practitioners?—Mr. VOSPER: It is not quite a stonewalling answer, because it relates to the Government's decision to offer to negotiate immediately for junior hospital doctors. On that question I am still awaiting a reply from the Negotiating Committee.

Cost of Prescriptions

Mr. BLENKINSOP asked the Minister the average cost per prescription under the National Health Service for the month of December, 1956; and how this compares with the average cost in December, 1955.—Mr. VOSPER replied: Approximately 5*s*. 6½*d*., which is about 11*d*. more than in December, 1955. Mr. BLENKINSOP: Does the Minister realise that there has been a serious further increase in the cost per prescription since the new charges were imposed? Does not that show the very grave danger of the advice to doctors to prescribe larger quantities per prescription?—Mr. VOSPER: A great part of this increase occurred before the new prescription charge was introduced, and it was also due in part to the increased chemists' remuneration and the release of new drugs, such as cortisone. Only in part was it due to the new prescription charge. As far as that is concerned, I should like to see the results for February and March before coming to a definite conclusion.

Mental Patients

Dr. A. D. D. BROUGHTON asked the Minister of Pensions and National Insurance the number of patients in mental hospitals in England and Wales who, by reason of having been given a prison sentence before being certified as of unsound mind, are not eligible for National Insurance benefits.—Mr. J. A. BOYD-CARPENTER: There are about 200 mental patients who were certified while undergoing a prison sentence which has not yet expired. I have no figures for the number detained under section 7 of the Criminal Lunatics Act, 1884. Under decisions of the National Insurance commissioner persons in both these categories are at present disqualified from receipt of National Insurance benefits. Dr. BROUGHTON: Does not the Minister agree that these unfortunate people are harshly treated in respect of National Insurance benefits? Is he aware that if mental disorder had been recognised and these people certified before court proceedings, they would not suffer the penalty of losing their National Insurance benefit, including even the taking away of tobacco tokens from old-age pensioners? Will he be good enough to look into the matter and consider the possibility of amending the law?—Mr. BOYD-CARPENTER: I am not without sympathy for the hon. Member's point of view, which I believe is shared by a number of people who have studied the subject. I must, however, await the Royal Commission's report which may affect the underlying law, but I have in mind, when that report is received, to refer this matter to my National Insurance advisory committee.

Mr. E. D. L. DU CANN asked the Chancellor of the Exchequer why retirement pensioner patients in mental hospitals who would otherwise be entitled to tobacco tokens are deprived of them.—Mr. ENOCH POWELL replied: Retirement pensioners are by statute entitled to tobacco tokens only if they receive their pension by means of weekly orders. Their entitlement ceases if their order books are withdrawn, as happens when the hospital concerned draws the pensions in bulk.

Anthrax Committee of Inquiry

Mr. IAIN MACLEOD, Minister of Labour, has announced the appointment of a committee to consider

the existing legal provisions concerning the importation of goods infected or likely to be infected with anthrax and the precautions

to be taken in connection with such imported goods for the protection of the health of persons.

The last full-scale inquiry into the question of precautions against anthrax was made forty years ago.

Blind Workers

The annual maximum grant to local authorities towards the cost of the provision of employment facilities for approved blind workers will be increased from £100 to £150 per worker from April 1 in view of the increase in costs.

Research in Delinquency and Recidivism

A total of £10,934 has been paid by the Home Office, under section 77 of the Criminal Justice Act 1948, to assist research on the causes of delinquency and the treatment of offenders, and a further £1000 is awaiting payment. In addition £2488 has been spent by the Social Survey as an allied service on behalf of the Home Office for research on these subjects.

Obituary

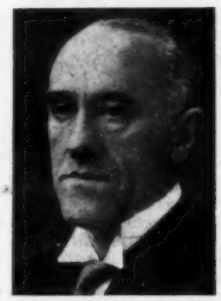
HUGH STANNUS STANNUS

C.B.E., M.D., Ph.D. Lond, F.R.C.P., D.T.M. & H.

By the death of Hugh Stannus on Feb. 27 tropical medicine has lost one of its oldest advocates, who was in many ways a pioneer.

He was born in 1877, the only son of Prof. Hugh Hutton Stannus, F.R.I.B.A. Educated privately, he studied medicine at St. Thomas's Hospital where he qualified in 1901. After holding house-appointments there he was appointed resident surgeon to the Hertford British Hospital in Paris. There he learned to speak fluent idiomatic French and attended the clinics of Poirier and Babinski.

In 1905 he was appointed medical officer to the King's African Rifles in British Central Africa and later was posted to Nyasaland as medical officer with headquarters in Zomba. He found himself much at home in primitive Africa with avenues of inquiry and research enticing him on every hand, and in the years before the outbreak of the first world war he made an intense study of anthropology and ethnology on the many interesting and primitive tribes of Nyasaland. His chief work was a monograph on the Wa-Yao people, which was well illustrated. He also published papers on pellagra, trypanosomiasis, blackwater fever, and piroplasmosis. Indeed the seeds of all his later work on the nutritional and venereal diseases were sown during his early tropical service. He was one of the first, if not the first, to draw attention to pellagra in Central Africa, as he saw it in Zomba prison in 1910. He pointed out the symmetry of the rash and disposed of the "maize theory" of its causation. In 1911 he took his M.D. and was awarded the university gold medal.



From 1914 to 1918 he served as principal medical officer of the Nyasa-Rhodesian Forces fighting von Lettow in Tanganyika. On his return to England after the war he was offered the post of director of medical services of the newly constituted Tanganyika Territory, but his health had been undermined and he was advised to refuse it. He therefore determined to make a fresh start in England, and after a year's postgraduate study he settled in consultant practice in London. He became physician to the French Hospital in Soho, where he remained till he retired in 1943. He was also associated with the old Hospital for Tropical Diseases at Endsleigh Gardens, and he was medical adviser to the Board of Inland Revenue and the High Commissioner for Rhodesia, and consultant to the Ministry of Pensions and Somerset House. He was a sectional editor of the *Tropical Diseases Bulletin*. He was elected F.R.C.P. in 1931.

In 1933 Stannus became interested in lymphogranuloma inguinale. He was the first to describe a case of this infection acquired in England and his most important book, *A Sixth Venereal Disease*, was published at this time. In 1937 he returned to the age-old question of the relationship of yaws to syphilis. During the late war he was consultant to the Ministry of Health on diseases of malnutrition and with Prof. V. Sydenstricker and Dr. R. Brunel Hawes started the rapid nutritional surveys. He also became interested in the ocular manifestations of ariboflavinosis which he summarised in his Lumleian lectures to the Royal College of Physicians in 1944. In 1942 he propounded a new theory on the ætiology of tropical sprue.

He was a chevalier of the Legion of Honour and of the Ordre de la Santé Publique; he held the Médaille de la Reconnaisance Française. In 1948 he was awarded the Treacher Collins prize and last year he was appointed C.B.E. He had also been a master of the Founders' Guild of London, and his interest in the history of the guild and of London perhaps led him to take up genealogy as a hobby. R. B. H. relates how

to this he brought a passion for accuracy. He would not accept any statement on family tradition however plausible when tracing a family unless he found documentary evidence confirming it. This led him on to searching hundreds of wills in Somerset House and ancient birth registers in many towns and villages as well as writing to and travelling to meet anyone who might give him any clue in his search. In one instance he suspected a man whose parentage was in doubt to be a natural son of George IV. He got into correspondence with a descendant in America who possessed a portrait of this man and obtained a photograph of this picture. Armed with this he searched until he obtained an engraving of George IV at the same age and in a similar posture to compare them. His genealogies must be remarkable not only for their accuracy but even more so because they included notes of events in the lives of those he recorded. He took great pleasure in the discussion of fresh ideas and puzzling cases, and his death will be a real loss to his many friends who delighted in his conversation.

P. M.-B. writes:

Stannus was well liked and especially respected by the younger members of the profession for his ever helpful attitude. His was a distinctive personality, with rather a hesitant speech adorned with little mannerisms. He would roll his eyes upwards, on being addressed, as if in alarm, break out into a smile, with a chuckle and ending in a kind of sigh. He was slightly built with a forward stoop, and a peculiar swinging gait. He always looked half-famished, but he was tough indeed, because he survived many years of ill health. In habit of mind he was critical; he could be argumentative and never took facts for granted.

G. P. writes:

Hugh Stannus's scholarly distinctions carried his reputation beyond these islands, but of this quiet humble man more could be written. Those nearest to his professional life on the staffs of his hospitals and those who served under, and with, him on committees will never forget his charm and gentleness in his dealings alike with patients and colleagues; and how, diffident as he always was in the defence of his own interests, in support of a colleague on a cause which he felt to be just he would, in a flash, become a raging lion.

In his younger days he was athletic and I well remember him, not so many years ago, swimming vigorously up and down the baths on a Saturday morning. The last decade of his life was crippled by rheumatism, but this in no way diminished his cheerfulness and youthful enthusiasm. Although a consulting physician in a circumscribed field, his interest in progress in all branches of medicine and surgery was intense, and he enriched any discussion in which he took an always humble part.

JAMES BEAVER MENNELL

M.A., M.D. Camb.

Dr. J. B. Mennell, consulting physician in physical medicine to St. Thomas's Hospital, London, who died at his home at Liss, Hampshire, on March 2, at the age of 77, pioneered the use of physical methods for reablement after fractures and other injuries.

From St. Paul's School he went to Pembroke College, Cambridge, and thence to St. Thomas's Hospital, from which he qualified in 1908. For the next twenty-seven

years he worked without interruption at St. Thomas's. His earliest appointments there included those of casualty assistant and house-surgeon; and even by then he had recognised the serious gap in the treatment of injuries after the initial phase. P. B. writes:

To summarise Dr. Mennell's professional activities by saying that his life was devoted to massage, manipulations, and remedial exercises would be a gross inaccuracy and an injustice. He was essentially a man of great clinical acumen who broke away from tradition, and with much courage and perseverance set out to apply physical methods to therapeutic ends. His interest in the field which must ever commemorate his name began when he was still a student at St. Thomas's Hospital, and observed that the after-treatment of fractures was virtually non-existent. After qualification, his concern with after-treatment of fractures and injuries in outpatients was rekindled, and very soon after he was appointed in the then "department of physical exercise" an unofficial clinic for fractures and trauma evolved under him.

As a pupil of Lucas-Championnière he employed initially the methods of his teacher, but he soon modified these and developed his many techniques aimed at early restoration of function. Many of these, considered unorthodox at the time, have now become a matter of routine, and in this sense can Dr. Mennell be looked upon as having laid the foundation of rehabilitation.

J. B., as he was affectionately called by his colleagues, was a dedicated man and never spared himself despite the indifferent health which forced him to retire from hospital work before his time in 1935.

His writing, his lecturing, and his starring in a film which he directed himself bear witness to his industry after retirement, and account for his deserved reputation as a teacher and a clinician, not only in this country and the Commonwealth but on the Continent and in America.

Much of his energy was spent in the interest of physiotherapists, and the school of physiotherapy at St. Thomas's Hospital owes much of its success to his encouragement and enthusiasm. His continued and devoted concern with physiotherapy earned him the chairmanship of the council of the Chartered Society of Physiotherapy after retirement, while at St. Thomas's Hospital his memory was kept alive in a bursary for teachers of physiotherapy, which bears his name. At the time of his death, he was still president of the Old Physiotherapy Students' Association.

Dr. Mennell had served as president of the section of physical medicine of the Royal Society of Medicine, and as a member of the council of the British Association of Physical Medicine. His books included *Physical Treatment by Movement, Manipulation, and Massage; Backache;* and *The Science and Art of Joint Manipulation.*

He is survived by his widow and three sons.

WILLIAM STOBIE

O.B.E., M.A. Oxfd, M.D. Edin., F.R.C.P., J.P.

Dr. William Stobie, for long consultant for tuberculosis to Oxford and to Oxfordshire and a past mayor of the city, died at his home at Cumnor on March 2 at the age of 70.

He was born in Edinburgh and was educated there at George Watson's College and the university. He graduated M.B. in 1908 and the following year he went to Oxford to become Osler's house-physician at the Radcliffe Infirmary. Later he held other resident appointments under the late Dr. A. G. Gibson and at the Eye Hospital. His knowledge and interest in general medicine had thus been firmly established and discerningly stimulated before he began to specialise in diseases of the chest. His work was given this direction by Osler's foundation of the Oxfordshire Association for the Prevention of Tuberculosis. Stobie was chosen as its first medical officer, and to begin with he visited the outlying clinics by motor-bicycle; and a colleague, recalling Stobie's still earlier experience as an assistant on horseback and push-bike, affirmed that "there is no doubt that he felt safer on these more primitive modes of progression than in his later motor-cars."

During the 1914–18 war Stobie did not lose touch with Oxford. He served as medical officer with the Oxford and Bucks Light Infantry. For his work he was twice mentioned in despatches and appointed O.B.E. After his return to civilian life he took the M.D. in 1921, and five years later he was appointed physician to the Osler pavilion for diseases of the chest at the Radcliffe Infirmary. In 1934 he became consultant in tuberculosis to the city and the county. The same year he was elected F.R.C.P. and in 1938 the university conferred on him the degree of M.A. When the National Health Service was started in 1948 he became consultant in diseases of the chest to the United Oxford Hospitals and clinical lecturer in the university. He retired from these posts in 1952.

In the midst of these professional responsibilities Stobie did not neglect his responsibilities as a citizen. In 1930 he had become an alderman and the following year he was elected mayor of the city. In 1932 he became a justice of the peace, and in 1951 he was elected chairman of the Oxford bench.

A colleague writes:

Few men can have had more friends than William Stobie—friends to whom he gladly gave more than most of them were able to give him in return. In thinking about his unusually full life, one is at first confused by the variety of his many-sided activities. We remember him first and foremost as "a good doctor" who always put the patient first—a memorial that many of us would deem sufficient in itself. His chief professional work lay in the treatment and prevention of tuberculosis, but he never lost his interest and enthusiasm in general medicine and in medicine related to ophthalmology. But Stobie's boundless mental and physical energy led him into many other branches of service to his fellow men, both in war and peace. We think of him as mayor of Oxford, as refereeing rugby football matches, as chairman of the bench, as a rose-grower, as a formidable expert on committee procedure, and an outspoken critic, yet the kindliest and most hospitable of men. We think of him as a small square man, always friendly, with a tremendous laugh on the appropriate occasion, and always busily employed in doing something to help someone else. We remember him with gratitude and affection.

In 1914 Dr. Stobie married Miss Irene Taylor of Shelsley Walsh, Worcestershire. She survives him with their two sons and their daughter.

HERBERT CALDER ELDER

M.B. Edin., M.R.C.P.E., D.P.H.

Dr. H. C. Elder, late chief tuberculosis officer of Edinburgh, died on Feb. 23 at the age of 68. He was educated at Harris Academy, Dundee, and at the Universities of St. Andrews and Edinburgh, graduating M.B. Edin. in 1917. His appointment as house-physician to Sir Robert Philip at the Edinburgh Royal Infirmary was the origin of his life-long interest in and enthusiasm for tuberculosis. A year after his appointment in 1919 as assistant tuberculosis officer to the corporation of Edinburgh, he was elected M.R.C.P.E. He was promoted to the post of chief tuberculosis officer after nine years' service, and he held this appointment until he retired in 1953.

At an early stage in his career he developed a special interest in the diagnostic procedures applicable to diseases of the chest, and he became one of the pioneers of bronchography in this country. Recognition of his capabilities as a clinician, and of his extensive knowledge of tuberculosis, led to his appointment as lecturer in this subject to the school of medicine of the Royal Colleges of Edinburgh in 1930. He resigned from this post in 1939 at the outbreak of war.

A colleague writes:

Dr. Elder's gifts of intense concentration and grasp of essential detail became evident in the skill with which he solved any pertinent problem and in his mastery of the wide variety of subjects in which he was interested. He was an accomplished musician, with a profound regard for the classics, a fluent French linguist, and, in his youth, a crack golfer. He tried to cloak a shy and retiring disposition with a brusqueness which was often misinterpreted. But his patients, whose interests and welfare were always his concern, were usually quick to recognise that his strictness as a disciplinarian was equalled by his warm humanity and innate kindliness.

Dr. Elder leaves a widow.

Notes and News

WOMEN CANDIDATES ONLY?

FOR some months doctors and patients in Edinburgh have been discussing whether a consultant vacancy in the Southern hospital group of the city should be restricted to women candidates. The regional hospital board proposes to combine two part-time appointments—one previously held by a woman at the Bruntsfield and Elsie Inglis Hospitals, the other held by a man at the Deaconess and Longmore Hospitals—to form a new post of consultant to the whole hospital group. The hospital management committee think that in open competition a woman candidate might not be appointed to this combined post, and they are disturbed because there would then be no woman medical specialist in the whole South-Eastern region, and because the change would break the tradition of the Bruntsfield and Elsie Inglis Hospitals, which have been staffed by women since their foundation over fifty years ago. The Secretary of State for Scotland has also received protests from the Edinburgh local medical committee and executive council and the Medical Women's Federation, and a petition signed by 20,000 people. He has announced, nevertheless, that he has decided not to interfere with the discretion of the regional hospital board. He adds that the board "have emphasised to him that should a woman candidate prove herself worthy in open competition she would be appointed to the combined post with their fullest confidence."

THE DENTAL SCENE

THE annual clinical meeting of the Guy's Hospital Dental School was held last Saturday. Besides the clinical cases there were numerous table demonstrations, which are always useful guides to new developments and methods in operative dental surgery—as well as serving to recall the various small, but often important points which tend to be forgotten in the press of routine dental practice. The ordinary dental engine still appears to be the best instrument for cavity preparation, in spite of the rival claims of air-propelled abrasive dust and ultrasonic drills. The emphasis is now on high-speed engines, with diamond or carbide burs, rotating at five or six times the speed formerly used, and Mr. W. A. Vale showed what could be accomplished with such a machine in the rapid and painless preparation of cavities. At the moment the limitations of this method are those imposed by the ability of the handpiece to stand continuous high-speed running.

The dental students are now encouraged to do original work, and the results of several ingenious and promising lines of research were on view. A problem that is still unsolved is whether the dentinal tubules contain nerve fibrils. J. W. Fernhead,[1] of the London Hospital, claims to have demonstrated their presence, but Guy's remains sceptical and holds to the view that pain during cavity preparation is caused by changes in hydrostatic pressure transmitted through the tubules to the pulp. Work is still in progress and perhaps by next year the answer will be known for certain.

In a lecture which he called Rock Around the Gas Room, Dr. W. S. McConnell contrasted—often with masterly understatement—the hospital gas-room of today with that of twenty-five years ago. Despite the attractions of cyclopropane, nitrous oxide and oxygen remains the standard anæsthetic for all dental patients over 4 years of age, but adjuvants and premedication are used freely when there are any possibilities of anæsthetic difficulties. Ethyl chloride, once given as a routine to children, is no longer used at all: instead divinyl ether, by itself, is given to children under 4, and for induction to children up to 6. Discussing the numerous drugs from which the anæsthetist can now choose, Dr. McConnell emphasised the value of intravenous pethidine for the apprehensive patient. He also remarked that in the ordinarily recommended dosages the barbiturates, methylpentynol, chlorpromazine, and an inert substance had all proved equally effective—or ineffective—in reducing apprehension in the dental chair.

A lecture by Prof. M. A. Rushton was illustrated by radiographs and photographs of some of the more unusual dental cases referred to him during the year by dental practitioners. Although some may regard oral pathology as one of the more esoteric branches of dental practice, the size of his audience showed the great interest in this subject. Afterwards he introduced a short teaching film on Biopsy Techniques made by Mr. B. E. D. Cooke—a valuable film not only for students but also for any dental surgeons who wish to ensure that their biopsy specimens will have the greatest value for the pathologist.

1. *J. Anat.* 1957 (in the press).

HOME-MADE

A REVIEWER may occasionally allow himself the pleasure of commenting on the excellence of the production of a work, and it gives particular pleasure to commend that of Dr. J. Gibson's[1] pamphlet on St. Lawrence's Hospital, Caterham, for it was set up and printed by the patients.

The Caterham Metropolitan Asylum (as the hospital was originally called), and its twin hospital at Leavesden, opened in 1870 to "such harmless persons of the chronic or imbecile class as could lawfully be detained in a workhouse." The hospitals owe their existence to the Metropolitan Poor Act, which was so largely inspired by Florence Nightingale. Under this act, the board of what was called ("with a reckless disregard of initials," says Dr. Gibson in his pleasing account) the Metropolitan Asylum District decided to build the two hospitals to an identical design. Many buildings have been added since; even in 1875 there was a swimming-bath.

Over 300 patients were admitted in the first year, and by 1877 the numbers had reached about 2000. In the early years most patients were psychotic, but now, of the total 2200, 2000 are mentally defective. They include children over the age of 5 years, some of whom are admitted only for short periods during which their parents cannot look after them. Most of the patients have severe degrees of deficiency, but useful occupation or instruction is found for many of them. The illustrations include photographs of a modernised ward, a classroom, and the new printing shop (provided by the Nuffield Provincial Hospitals Trust) where the pamphlet was produced.

HELP FOR DISABLED PEOPLE

A SERIES of articles has been appearing in the *Social Service Quarterly* in recent years on what is being done to help disabled people. This series has proved very popular, and the first fifteen articles have now been published in book form.[2]

As the late Dame Georgiana Buller pointed out in her introduction, there are few tasks—if indeed any—which call for complete physical integrity. The remaining essays are concerned with what can be done to train and use the able remnant of the maimed person. Some cover specific disabilities (such as deafness) or specific groups (such as school-leavers); others discuss organisations at world and at county level. There is much useful factual information, including an enlightening account of many ingenious but simple devices (such as a fixed nailbrush for the one-handed man) which can make life at home or at work much easier.

The picture this booklet presents of what can be done is as encouraging as it is stimulating. To quote Dame Georgiana Buller again, "Pity is a cheap emotion and a negative one. True sympathy—feeling with—demands the effort of comprehension and is productive of results."

University of Cambridge

On Feb. 23 the degree of M.B. was conferred by proxy on R. H. Lavelle.

Royal College of Surgeons of England

Mr. A. Lawrence Abel will deliver the Bradshaw lecture on Thursday, March 14, at 5 P.M., at the college, Lincoln's Inn Fields, London, W.C.2. He is to speak on diseases of the large intestine.

Victor Horsley Lecture

Sir Geoffrey Jefferson, F.R.S., will deliver this lecture at the house of the British Medical Association, Tavistock Square, London, W.C.1, on Friday, April 12, at 5.30 P.M. This is the centenary of Horsley's birth and Sir Geoffrey is to speak on his life and work.

Society for Social Medicine

This new society will hold its first scientific meeting in Birmingham from Sept. 24 to 26. The hon. secretary is Dr. Alice Stewart, Department of Social Medicine, 8, Keble Road, Oxford.

1. Gibson, J. St. Lawrence's Hospital, Caterham, Surrey: 1870–1956. Printed at the hospital. Pp. 13.
2. The Welfare of the Disabled. National Council of Social Service, 26, Bedford Square, London W.C.1. Pp. 101, 5*s*.

Chest Diseases and the Family Doctor

A weekend course on this subject for general practitioners is to be held at Norwich on April 13 and 14. Further particulars can be had from the Tuberculosis Educational Institute, Tavistock House North, London, W.C.1.

Blindness in Mental Deficiency

A meeting on this subject will be held at the Fountain Hospital, Tooting Grove, London, S.W.17, on Wednesday, March 13, at 5.30 P.M. The speakers will be Prof. Arnold Sorsby, Dr. L. Crome, and Dr. C. E. Williams.

Humane Technique in the Laboratory

The Universities Federation for Animal Welfare is holding a symposium on this subject at Birkbeck College, Malet Street, London, W.C.1, on Wednesday, May 8, at 9.45 A.M., under the chairmanship of Prof. P. B. Medawar, F.R.S.

Institute of Diseases of the Chest, London

There will be a discussion for general practitioners at this institute (in the grounds of the Brompton Hospital, S.W.3) on Tuesday, April 9, at 2.30 P.M., on hay-fever and asthma. Further information may be had from the secretary of the institute.

British Association of Physical Medicine

The annual meeting of this association will be held on April 5 and 6 at the Middlesex Hospital, London, W.1. The programme includes a discussion on poliomyelitis, when the opening speakers will be Dr. R. W. Gilliatt, Mr. D. M. Brooks, Dr. B. E. W. Mace, and Squadron-Leader C. B. Wynn Parry. Further particulars may be had from the association, 45, Lincoln's Inn Fields, W.C.2.

National Association for Mental Health

The subject of the annual conference of this association, which is to be held at Church House, Westminster, London, S.W.1, on April 11 and 12, is to be The Maladjusted Child—the Underwood report and after. The speakers will include Dr. Kenneth Soddy, Dr. John Bowlby, and Dr. Mildred Creak. Further particulars may be had from the association, 39, Queen Anne Street, W.1.

Sixteen specialists from nine countries are visiting London hospitals to see demonstrations in anæsthesia. They are taking part in a course arranged by the British Council and the Faculty of Anæsthetists of the Royal College of Surgeons of England.

Diary of the Week

MARCH 10 TO 16

Monday, 11th

UNIVERSITY COLLEGE LONDON, Gower Street, W.C.1
5 P.M. Dr. George Popjak: Biochemistry of Fatty Acids and Cholesterol. (Second of three lectures.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Prof. A. C. Frazer: Steatorrhœa.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. G. Cochrane: Leprosy.

Tuesday, 12th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Prof. J. M. Squire: Functions of the Plasma Proteins (First of two Oliver-Sharpey lectures.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Psychiatry.* Prof. Erwin Stengel, Dr. Hunter Gillies: Diagnosis of Schizophrenia.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. Robert Cruickshank: Use of Antibiotics.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Cochrane: Leprosy.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean Street, W.1
5.30 P.M. Mr. Joseph Minton: Ocular Manifestations in Clinical Neurology. (First of two lectures.)
CHELSEA CLINICAL SOCIETY
8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7.) Colonel L. Van Der Post: Some Personal Experiences of Primitive Africa.
MANCHESTER MEDICAL SOCIETY
8 P.M. (Clinical Sciences Building, York Place, Manchester, 13.) *Surgery.* Mr. A. F. Robinson, Dr. M. P. Cole: Hormones and Adrenalectomy in Metastatic Breast Carcinoma; Dr. Ralston Paterson: Postoperative Radiotherapy in Breast Cancer.

Wednesday, 13th

ROYAL SOCIETY OF MEDICINE
8 P.M. *Proctology.* Mr. P. Warren: History of Excision of the Rectum; Mr. P. F. Boreham: Benign Stricture of the Colon; Mr. Harold Dodd: Pelvic Abscess. Mr. A. Lawrence Abel and Mr. Gordon Ungley: Hæmorrhoids or Piles. (Colour film.)
ST. MARY'S HOSPITAL MEDICAL SCHOOL
12 NOON. Dr. C. A. H. Watts: Psychology and Psychiatry in Family Doctoring.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. Henry Haber: Cellular Nævi and Melanomata.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Histological Diagnosis of Fungus Infections.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. Paul Wood: Aortic Stenosis.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. J. S. Anderson: Infectious Diseases.
UNIVERSITY OF OXFORD
5 P.M. (Radcliffe Infirmary.) Prof. Pierre Lacroix: Experimental Study of Bone Grafting Operations.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) *Pathology.* Dr. R. F. Jennison, Dr. F. A. Langley: Perinatal Pneumonia.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow
5 P.M. Mr. George Smith: Cardiac Hypertrophy—an Experimental Study. (Watson lecture.)

Thursday, 14th

ROYAL COLLEGE OF PHYSICIANS OF LONDON
5 P.M. Professor Squire: Functions of the Plasma Proteins. (Second of two Oliver-Sharpey lectures.)
ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. Lawrence Abel: Diseases of the Large Intestine. (Bradshaw lecture.)
UNIVERSITY OF LONDON
5.30 P.M. (University College, Gower Street, W.C.1.) Prof. A. H. Schultz, D.PHIL.: Old and New Views Concerning Man's Specialisations.
ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Prof. Vladimir Cavka (Belgrade): Clinical and Experimental Study of Ophthalmo-neurological Symptoms in Lesions of the Frontal Brain.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. G. C. Wells: Use of Steroids in Dermatology.
NUFFIELD ORTHOPÆDIC CENTRE
8.30 P.M. (Wingfield-Morris Orthopædic Hospital, Oxford.) Mr. D. Ll. Griffiths: Volkmann's Contracture—Second Thoughts.
LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. *Pathological Meeting.* Dr. J. N. Marshall Chalmers: Thymectomy and Splenectomy in Pure Red Cell Anæmia.

Friday, 15th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and Preventive Medicine.* Dr. W. P. D. Logan, Prof. A. C. Stevenson, Dr. W. C. Cockburn: Ascertainment of Disease.
8.15 P.M. *Radiology.* Prof. Robert McWhirter: Evaluation of Treatment Policies in Malignant Disease. (Presidential address.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Sir Harry Platt, F.R.C.S.: Causes and Prevention of Deformity.
4 P.M. Prof. C. H. Stuart-Harris: Respiratory Virus Infections.
FACULTY OF RADIOLOGISTS
5 P.M. (Royal College of Surgeons.) Dr. Martin Bodian: Neoplastic Diseases in Childhood.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW
8.30 P.M. (Royal Faculty of Physicians and Surgeons of Glasgow.) Dr. J. F. Crooks: Cervical Spondylosis; Mr. G. E. Schofield: Post-gastrectomy Diarrhœa; Dr. C. Douglas: Aftermath of Puerperal and Post-abortive Sepsis.

Appointments

ANDERSON, G. L., M.B. Durh.: school M.O., co. Durham.
* BROOKES, V. S., M.B. Birm., F.R.C.S.: part-time consultant surgeon, United Birmingham Hospitals at the Children's Hospital, Birmingham.
JACKSON, T. F. M., L.R.C.P.E.: school M.O., co Durham.
JAMES, J. A., M.B. Lond., F.R.C.S.: part-time consultant orthopædic surgeon, mid-Worcestershire H.M.C.
LLOYD-ROBERTS, G. C., M.B. Camb., F.R.C.S.: part-time consultant in orthopædic surgery, St. George's Hospital, London.
MORRISSEY, D. M., M.CH. N.U.I., F.R.C.S.: part-time consultant surgeon, United Birmingham Hospitals and Dudley and Stourbridge H.M.C.
STENHOUSE, R. A., L.M.S.S.A., D.P.H.: M.O.H., Downham Market.

Liverpool Regional Hospital Board:

ANNIS, DAVID, CH.M. Lpool, F.R.C.S.: assistant consultant general surgeon, Clatterbridge General Hospital.
LOTHIAN, K. R., M.B. N.Z., F.R.C.S.: assistant consultant general surgeon, St. Catherine's Hospital, Birkenhead.
MURPHY, A. F., CH.M. Lpool, F.R.C.S.: assistant consultant general surgeon, Birkenhead General and St. Catherine's Hospitals.
PARRY, E. W., CH.M. Lpool, F.R.C.S.: consultant general surgeon, Bootle and Waterloo Hospitals.

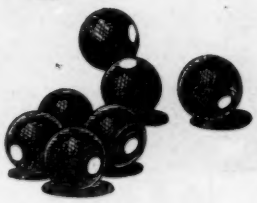
* Amended notice.

Births, Marriages, and Deaths

DEATHS

HARRIS.—On Feb. 23, at his home, Merrow Down, Rottingdean, Sussex, Charles Poulett Harris, M.D., aged 85.

Appeals . . . throughout the ages



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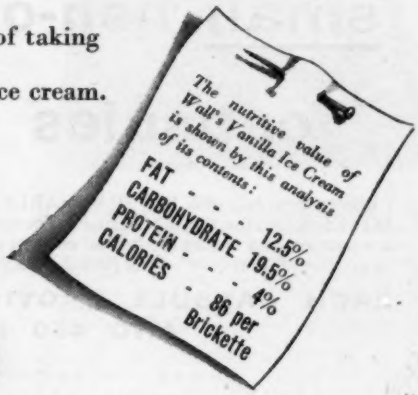
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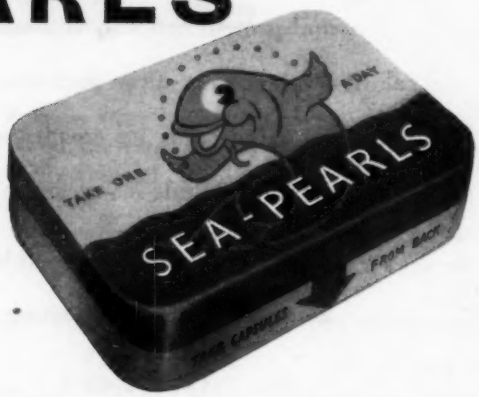

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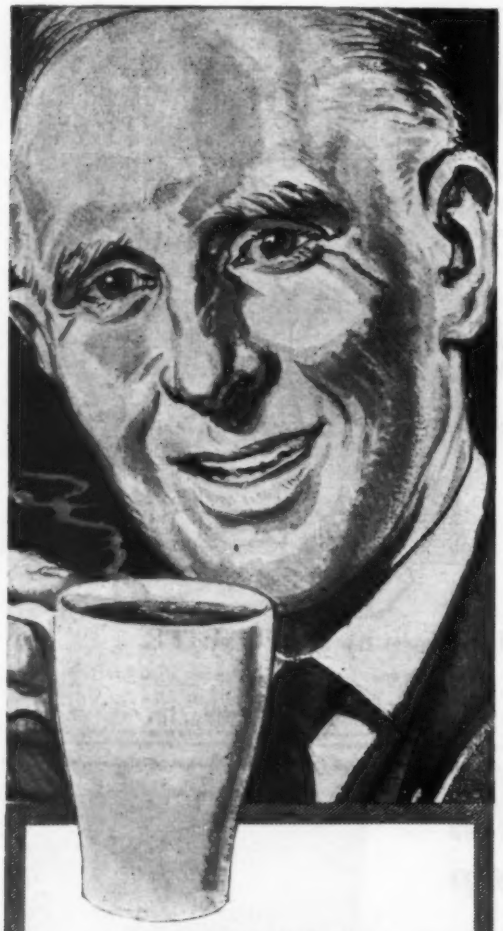

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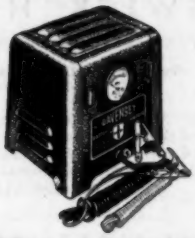

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Further details may be obtained from the Assistant Secretary, The Royal College of Physicians, Pall Mall East, London, S.W.1, by whom applications for the Fellowship, accompanied by the names of 2 referees, must be received not later than 31st May, 1957.

L.M.S.S.A.

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For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

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UNITED BRISTOL HOSPITALS. Applications are invited for an appointment as RESEARCH FELLOW IN PÆDIATRICS. The project involves in the first instance a study of respiratory function and structure in health and disease in the early years of life, with particular reference to recurrent or persistent infection and its long term effects. The candidate appointed will carry out research in the United Bristol Hospitals under the direction of the Professor of Child Health, University of Bristol. Technical assistance and equipment will be provided. The appointment, which will be for 1 year in the first instance, will be made in the Senior Registrar or Registrar grade according to age, qualification and experience.
Applications, giving full particulars and the names of 2 referees, to the Secretary, Royal Infirmary, Bristol, 2, by Monday, 25th March, 1957.

UNIVERSITY COLLEGE OF THE WEST INDIES. Applications are invited for (*a*) SENIOR LECTURESHIP or (*b*) LECTURESHIP IN OBSTETRICS AND GYNÆCOLOGY. Duties include instruction of students reading for medical degrees of University of London, research and clinical work in University College Hospital. Salary scales (*a*) £1700–£100–£2400 p.a., (*b*) £1100–£100–£1500–£100–£1900 p.a. Entry point in scales, and grade of (honorary) appointment on Hospital staff, determined by qualifications and experience. Child allowance. F.S.S.U. Unfurnished accommodation at rent of 5% of salary. Passages paid for up to 5 persons on appointment, normal termination and study leave (once every 3 years). Duties to be assumed by 1st October, 1957, or as soon as possible thereafter.
Detailed applications (10 copies), giving full particulars of qualifications and experience and the names of 3 referees, should be received by 8th April, 1957, by the Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF SASKATCHEWAN. Department of ANÆSTHESIA, UNIVERSITY HOSPITAL. Applications are invited from qualified medical practitioners for the post of CLINICAL AND RESEARCH FELLOW (non-resident). Duties will include administration of anæsthetics and assisting the Staff with teaching of students and house staff, as well as with research projects. The Department is fully approved by all examining specialty bodies in Canada, the U.K. and the United States. Completion of training is a prerequisite and preference will be given to holders of the F.F.A.R.C.S. or equivalent qualifications such as American Boards. Appointment is to start on 1st July, 1957, and will be tenable for 1 year. Remuneration Canadian $5000 p.a.
Applications, including recent photograph, curriculum vitæ and 3 references, should be addressed to—
GORDON M. WYANT, F.F.A.R.C.S., Professor of Anæsthesia, University of Saskatchewan, Saskatoon, Canada.

DALHOUSIE UNIVERSITY, Halifax, Nova Scotia, CANADA. Applications are invited for the post of ASSISTANT PROFESSOR OF PHYSIOLOGY at a salary of $5000.
Apply to the Dean, Faculty of Medicine.

Hospital Services: Senior Appointments

ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3. Locum Tenens CONSULTANT ANÆSTHETIST required immediately, for 6–12 months. 3 sessions (Monday afternoon and all day Thursday).
Apply to House Governor, by 18th March, 1957.

KING'S COLLEGE HOSPITAL, Denmark-hill, London, S.E.5. Applications are invited for a Part-time CONSULTANT in Surgery for 5 sessions per week, the post to be combined with that of Surgical Tutor to the Medical School. The successful applicant will devote in addition the equivalent of 3 sessions to his Medical School duties, for which the salary will be £750 p.a. The post is tenable from 7th May, 1957.

Applications (12 copies), giving details of age, qualifications and experience, and with the names of 3 referees, should be sent to the undersigned not later than 30th March, 1957.

S. W. BARNES, House Governor.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the appointment of Part-time CONSULTANT in General Surgery. The successful candidate will be required to undertake up to 5 notional half-days per week with effect from 1st October, 1957.

Applications (14 copies), stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should be sent not later than 20th April, 1957, to the House Governor, St. Mary's Hospital, London, W.2, from whom further information may be obtained.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Locum RADIOLOGIST required for 8 sessions per week from 8th to 28th September, 1957.

Applications, giving details of experience, with the names of 2 referees, to Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton, 7.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRISTS (Senior Hospital Medical Officer scale) for duties at :—

(i) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics at general hospitals. Resident or non-resident. A large modern flat is available if required and accommodation is also available for a single person.

(ii) Clifton Hospital, York (1112 Beds), and associated clinics at Harrogate, York, and Scarborough. The person appointed may also have duties at Claypenny Hospital for Mental Defectives (1 session per week). Small flat available.

Applicants should hold the D.P.M. or other equivalent qualification.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, and names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 26th March, 1957.

LIVERPOOL REGIONAL HOSPITAL BOARD. Walton HOSPITAL. Applications are invited for the post of CONSULTANT GENERAL SURGEON with duties mainly at the above Hospital. The successful candidate will work with the existing Senior Surgeons at the Hospital and the appointment will be whole-time with the option to transfer to maximum part-time service at the end of 3 years. Applicants must have wide experience in the specialty and possession of a higher qualification in general surgery is essential.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 30th March, 1957.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time TUBERCULOSIS MEDICAL OFFICER (Senior Hospital Medical Officer) with duties in the Liverpool and District Eastern Hospital Management Committee Area. The successful applicant will work under the supervision of a Consultant Chest Physician and will undertake prevention and aftercare duties with the local health authority concerned. Candidates should have good general medical experience and special experience in tuberculosis.

Application forms from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 30th March, 1957.

VINCENT COLLINGE, Secretary to the Board.

LUTON AND DUNSTABLE HOSPITAL, Luton. (250 Beds.) LOCUM for Consultant General Surgeon required, whole or maximum part-time for 2 weeks from about 20th March, 1957.

Apply to Medical Director of the Hospital, naming 2 referees.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT E.N.T. SURGEON (6 or 7 half-days a week), Edgware General Hospital, Edgware, Middlesex (638 Beds). Post vacant July, 1957.

Applications before 8th April, 1957.

(2) ASSISTANT PHYSICIAN (Infectious Diseases), whole-time, Senior Hospital Medical Officer grade, South Middlesex Hospital, Mogden-lane, Isleworth (145 Beds—approximately 90 for fevers, 1 surgical ward and Ophthalmic Unit). Successful candidate required to live within easy reach of the Hospital. Post offers excellent opportunity for postgraduate study for higher degrees.

Applications before 11th April, 1957.

(3) ASSISTANT CHEST PHYSICIAN (whole-time), Senior Hospital Medical Officer grade, Hounslow Chest Clinic, 28, Bell-road, Hounslow, Middlesex. Associated with the Clinic are 26 Beds in Ashford Hospital, and 35 in West Middlesex Hospital. Candidates should have good general medical experience and special experience in treatment of tuberculosis and diseases of the chest.

Applications before 15th April, 1957.

Hospitals and Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry KNOWLE HOSPITAL, RYHOPE, SUNDERLAND. (850 Beds.) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), whole-time. Candidates should normally hold a D.P.M. but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine, including Senior Registrar posts, and intend to obtain a D.P.M. and specialise in psychiatry. The appointment is resident or non-resident. A flat is available. If non-resident the successful candidate will be required to reside in close proximity to the Hospital. Full particulars from Regional Psychiatrist.

Applications, together with names and addresses of 3 referees, to be sent to the Regional Psychiatrist, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

CONSULTANT E.N.T. SURGEON at the Western Infirmary, Glasgow. The appointment is part-time on the basis of 7 notional half-days per week.

Whole-time ASSISTANT PSYCHIATRIST based at Hartwood Mental Hospital, Shotts, Lanarkshire. A house is available. Salary (at age 32 and over) on the scale £1575–£50–£2025.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer grade) required for the Nottingham General Hospital. Successful candidate will work under the direction of the Consultant-in-charge, and will be required to undertake occasional sessions at other hospitals in the Nottingham area. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 6th April, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT SURGEON (8 half-days per week) for the Chichester Group of hospitals (7 half-days per week) and Graylingwell (Mental) Hospital, Chichester (1 half-day per week). Candidate appointed will be required to undertake to live in, or adjacent to, Chichester.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, by 6th April, 1957. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires CONSULTANT RADIOLOGIST (whole-time or maximum part-time) for the Chichester Group of hospitals. Duties will include 1 session per week at Graylingwell (Mental) Hospital, Chichester. The Consultant appointed will be in charge of the radiology in the Chichester Group. Candidates should have F.F.R. preferable, or D.M.R., and wide experience in radiology.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 6th April, 1957. Applicants may visit hospitals by local arrangement.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of OPHTHALMOLOGIST. The main duties of the appointment will be concerned with the School Eye Service in North-East Somerset but there will be a regular session at the Bristol Eye Hospital where the Ophthalmologist will have an honorary appointment as Clinical Assistant. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade.

Applications (12 copies), stating date of birth, qualifications and experience together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th March, 1957.

NORTHERN IRELAND HOSPITALS AUTHORITY. Locum Tenens for Consultant. Applications are invited for a whole-time post as Locum Tenens RADIOLOGIST at hospitals managed by the North West Hospital Management Committee. The appointment will be for the period 29th April–22nd May, 1957, inclusive. Remuneration will be at the rate of 31½ guineas per week, or, if the locum is of Consultant status, at the rate of £50 per week.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned as soon as possible.

CANADA. CHILDREN'S HOSPITAL, 250, West 59th-avenue, VANCOUVER, 15, BRITISH COLUMBIA. PÆDIATRIC RESIDENT required for 1 year commencing 1st July, 1957, for 83-Bed children's acute and long-term and surgical hospital. Accommodation available. Remuneration $175 per month, less $15 per month accommodation.

Applications, stating age, qualifications, nationality, marital status, accompanied by recent references and photograph, should be forwarded by air-mail to the Administrator.

U.S.A. VIRGINIA. Progressive state mental hospital in Virginia, 4600 Beds, expanding staff, invites applications for PHYSICIANS at all levels, psychiatric experience desirable but not necessary. Salary from $8040 (approximately £2750). All modern methods of treatments. Opportunities for research. Good retirement plan.

Apply to JUUL C. NIELSEN, M.D., Superintendent, sending full résumé in first letter to Box 271, Petersburg, Virginia, U.S.A.

U.S.A. HOLZER CLINIC, Gallipolis, Ohio. Preceptor (internal medicine) required at 15-man specialty clinic, located in 150-Bed, fully-equipped, non-profit hospital. Functions as referral centre serving 100-mile radius. Only community type general hospital in area. All major specialties represented. University of Cincinnati active surgical residency affiliation. Preceptor works exclusively with 4 Board Certified Internists seeing 10,000 patients, 1600 hospitalisations, annually. Active teaching programme. Duties include medical clinic emphasising complete diagnostic studies and supervised hospital service. Unique opportunity for practical training with private clinic and general hospital. 1–3 years medical residency or equivalent required. Extremely valuable as practice time while studying for Boards or refresher training. 6–36 months appointments. Salary $5000–$10,000 considering qualifications. Good housing. Starting date open. Travel cost and maintenance to be discussed.
Reply to JOHN J. SCHWAB, M.D., Department of Medicine.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD AND UNIVERSITY OF OTAGO, NEW ZEALAND. JUNIOR SPECIALIST ANÆSTHETIST—Dunedin Hospital—ASSISTANT LECTURER in Anæsthetics—Otago Medical School.

Applications are invited for the above position which is vacant at the present time, from those who hold a Degree in Medicine of an approved University. The position is full-time and private practice is not permitted. The position is designated as that of Junior Specialist under the Hospital Employment (Medical Officers) Regulations, salary scale £1600–£1900 by annual increments of £100. The commencing salary will be in accordance with the appointee's qualifications and experience. Duties will include the practical teaching of anæsthetics to Medical and Dental Students. The position is non-resident. Travelling expenses will be paid in accordance with the table set out in the conditions of appointment.

Applications for this position should be made on the prescribed form obtainable from the office of the High Commissioner for New Zealand, 415, Strand, London, or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, who will supply further information and Conditions of Appointment. Applications should be in the hands of the undersigned not later than 10 A.M. on Monday, 25th March, 1957.

W. A. WILLIAMSON, Secretary.
Otago Hospital Board, P.O. Box 946, Dunedin, New Zealand.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. UNIVERSITY OF CAPE TOWN. Joint Medical Staff for Groote Schuur and other Teaching Hospitals. Vacancies :—

Applications are invited from registered medical practitioners for appointment to the following vacant posts at the Groote Schuur Hospital, Observatory, Cape Town :—

DEPARTMENT OF RADIO-DIAGNOSIS

(*a*) MEDICAL PRACTITIONER (Grade F), with salary at the rate of £1980 p.a. (fixed) ; and
(*b*) MEDICAL PRACTITIONER (Grade C), with salary at the rate of £1380 p.a. (fixed).

In addition to the basic salary, a non-pensionable cost-of-living allowance at rates prescribed from time to time by the Administrator (at present amounting to £234 p.a.) is payable to certain whole-time married officials and employees.

The conditions of service are governed by the relevant Ordinances and Regulations as well as the agreement entered into between the Cape Provincial Administration and the University of Cape Town.

The Joint Medical Staff is required to serve jointly the Provincial Administration and the University of Cape Town.

QUALIFICATIONS

Grade F.—The successful candidate must be a registered Specialist in Radio-diagnosis, or must be in possession of an appropriate postgraduate diploma or degree.

Grade C.—The successful candidate must have not less than 5 years experience after graduation or 4 years experience after registration, of which not less than 3 years shall have been spent in training as a Specialist in Radio-diagnosis.

Candidates are requested to state whether they will be prepared to accept an appointment at a lower grade if not successful in obtaining appointment to the post applied for, and to furnish particulars in regard to the following :—

(i) Academic achievements (degrees and diplomas held and the standard of achievement in professional examinations ; scholarships and special awards) ;
(ii) Professional experience (not only a statement of employer, but the institution in which the individual worked and the type of work undertaken) ;
(iii) Names of 3 referees (1 of these should preferably be someone occupied in the same branch of medicine as the candidate), or to approach their referees to submit confidential reports to the Director of Hospital Services, P.O. Box 2060, Cape Town, before the closing date for the receipt of applications.

Applications must be made in duplicate on the prescribed form, Staff 23, which, together with details as regards conditions of service and transport facilities, is obtainable from the Staff Clerk, Room 309, South Africa House, Trafalgar-square, London, W.C.2.

The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 5th April, 1957.

Candidates must state the earliest date on which they can assume duty.

Hospital Services : Junior Appointments

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEON (resident) required from 5th April, 1957. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 20th March, 1957.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. SURGICAL OFFICER (resident) Junior Hospital Medical Officer grade, vacant end of March.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE PHYSICIAN (pre-registration) required, vacancy 28th March.

Applications, stating experience and 2 testimonials, to Hospital Secretary.

BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (general medicine). The post is vacant mid-April and is tenable for 1 year. 90 acute medical beds. Salary £745 p.a., less £150 p.a. if resident.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

CHARING CROSS HOSPITAL, W.C.2. Full-time GYNÆCOLOGICAL AND OBSTETRIC REGISTRAR (resident). Tenable as soon as possible after 1st April, 1957, for 1 year in the first instance with eligibility for renewal.

Applications, on forms obtainable from the undersigned, to be returned by 23rd March, 1957.

FRANK HART, Secretary to the Board.

DULWICH HOSPITAL, East Dulwich-grove, S.E.22 (in association with Kings College Hospital Medical School for teaching purposes). Applications invited for appointment as SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant from 17th April, 1957. Recognised for M.R.C.O.G. (obstetrics only).

Applications, giving age qualifications, experience, with names of referees or copy testimonials, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, S.E.22, not later than 22nd March.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the post of RESIDENT PATHOLOGIST. Salary in accordance with Ministry of Health scale for Senior House Officers. The appointment is for 6 months in the first instance. Duties to commence 1st April, 1957.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, as soon as possible.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st May, 1957. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th March, 1957.

HORNSEY CENTRAL HOSPITAL, Park-road, N.8. RESIDENT SURGICAL OFFICER (Senior House Officer grade) to assist the part-time Consultant staff. The post affords good general experience (medicine and surgery) and would be beneficial to a fully registered doctor intending to go into general practice and one reading for higher qualifications. The Hospital may be visited by direct arrangement.

Application forms obtainable from, and returnable to, the Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, Highgate, N.6, by 18th March 1957.

KING EDWARD MEMORIAL HOSPITAL, Ealing. HOUSE OFFICER to General Surgeon with some E.N.T. duties. Vacant now. Recognised for Fellowship. Preference given to persons seeking pre-registration posts.

Applications, stating age, nationality, qualifications with experience and dates, and copies of 2 recent testimonials, to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 18th March.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st May for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and previous surgical experience.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 19th March.

THOMAS BROWN, House Governor.
London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the posts of 2 REGISTRARS in General Medicine. A higher qualification, although desirable, is not essential. The appointments will be for 1 year, renewable for a maximum of 2.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 28th March, 1957. H. BRIERLEY, House Governor.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (Anæsthetist), vacant 21st March, 1957. The post is recognised for the F.F.A.R.C.S.

Apply, stating age, nationality, qualifications, and experience, together with 2 testimonials, to Hospital Secretary by 15th March, 1957.

METROPOLITAN HOSPITAL, Kingsland-road, E.8. (General—146 Beds.) HOUSE SURGEON now vacant.

Applications, stating age, nationality, qualifications or probable date of qualification and experience with copies of 3 recent testimonials, to the Hospital Secretary as soon as possible.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of SENIOR REGISTRAR in the Department of Physical Medicine and Rheumatism. Candidates must hold a higher qualification in medicine.

Forms of application, obtainable from Deputy Superintendent, should be returned, naming 2 referees, by 6th April.

MIDDLESEX HOSPITAL, W.1, AND NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CENTRAL MIDDLESEX HOSPITAL. Whole-time SENIOR SURGICAL REGISTRAR required. Appointment in first instance at Central Middlesex Hospital, Park Royal, N.W.10. After approximately 2 years the successful candidate will be transferred to the Middlesex Hospital. Candidates should hold higher surgical qualification. Duties will include outpatient sessions and teaching. Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 30th March, 1957.

MOORFIELDS EYE HOSPITAL (High Holborn Branch), High Holborn, W.C.1. Applications are invited from Male practitioners for the following posts :—

(1) THIRD RESIDENT SURGICAL OFFICER (Registrar grade). The successful candidate will be required to take up his duties on 1st June, 1957. If recommended by the Medical Committee he will be eligible for appointment consecutively as Second Resident Surgical Officer on 1st December, 1957, and Senior Resident Surgical Officer for a period of 6 months from 1st June, 1958, making a total period of service of 18 months.

(2) SENIOR HOUSE OFFICER (non-resident). The successful candidate will be required to take up his duties on 1st June, 1957. If recommended by the Medical Committee, he will be eligible for appointment to the above posts as from 1st December, 1957, making a total period of service of 2 years.

Experience in ophthalmology is essential.

Forms of application are obtainable from the undersigned, to whom they should be returned, with copies of not more than 3 testimonials, by 22nd March, 1957.

J. P. HEMING, Secretary.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of a SENIOR REGISTRAR (whole-time) for work in the Academic Unit in Clinical Neurology. The appointment will be for 1 year in the first instance.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 30th March, 1957.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Psychiatric Research (non-resident), Runwell Hospital, near Wickford, Essex. Duties in Research Department.

SURGICAL REGISTRAR (resident or non-resident, sleeping in on duty nights), St. Leonard's Hospital, N.1. Recognised for F.R.C.S.

Full or maximum Part-time REGISTRAR (non-resident, near Hospital), Regional Ophthalmic Centre, Oldchurch Hospital, Romford, Essex.

ORTHOPÆDIC AND ACCIDENT REGISTRAR (resident or non-resident, near Hospital), St. Margaret's Hospital, Epping, Essex. Recognised for F.R.C.S.

MEDICAL REGISTRAR (resident), Chelmsford and Essex and St. John's Hospitals, Chelmsford, Essex.

Part-time E.N.T. REGISTRAR (non-resident) (4 sessions a week), Queen Elizabeth Hospital for Children, Hackney, E.2. Experience in treatment of diseases of children desirable.

REGISTRAR in Thoracic Medicine (non-resident), East Ham Chest Clinic, E.7. Candidates must have experience in general medicine and diseases of the chest. Duties include outpatient work at the Chest Clinic and inpatient work at Plaistow Hospital Chest Unit. The appointment offers excellent opportunities in all aspects of thoracic medicine and for applicants who have not got the M.R.C.P. there are good facilities for postgraduate study.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 23rd March.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. RESIDENT ANÆSTHETIST (Senior House Officer) required with previous anæsthetic experience. Hospital is recognised for training for D.A. and F.F.A. R.C.S. and offers a wide experience in anæsthetics (over 10,000 operations a year). Appointment : Locum 21st–30th April, followed by 6 months from 1st May, with possible extension to 1 year.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 19th March.

PADDINGTON GREEN CHILDREN'S HOSPITAL. (ST. MARY'S HOSPITAL, W.2.) Applications are invited for the post of CASUALTY OFFICER. Post-registration appointment, non-resident, House Officer grade, tenable for 6 months, as from 1st May, 1957.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 16th March, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. JUNIOR CASUALTY OFFICER (House Officer third post) required for 6 months commencing 8th April, 1957.

Applications, together with the names of 3 referees, to Hospital Secretary by 21st March, 1957.

ROYAL FREE HOSPITAL. Applications are invited for the post of non-resident Locum SENIOR E.N.T. REGISTRAR at the Royal Free Hospital for 4 weeks, preferably in March. Terms and conditions of service in accordance with the scale laid down by the Ministry of Health for locum Senior Registrars.

Applications should be made to the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, as soon as possible.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. There will be a vacancy for an ANÆSTHETIC REGISTRAR (resident or non-resident) as from 1st May, 1957, to work as required at both hospitals. Applicants should have had some special experience in anæsthesia and preferably should hold, or be working for, a higher qualification in that specialty. Registrar grading and salary in accordance with the terms and conditions of service under the National Health Service Act.

Applications, giving full particulars of age, qualifications and experience, with the names of 2 referees, should be sent to the House Governor by 31st March, 1957.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. REGISTRAR in Radiology, X-ray Diagnostic Department, required. D.M.R.D. essential. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary by 19th March, 1957.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. Applications are invited for the post of SENIOR HOUSE OFFICER (thoracic), resident or non-resident.

Applications, stating age, qualifications, experience, together with names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the whole-time post of REGISTRAR to the Diagnostic X-ray Department of the St. George's Hospital Group. Special facilities will be available for research work, and for those wishing to take higher qualifications. Candidates must possess a Diploma in Radiology. The post is non-resident, and the successful candidate will be required to take up duty as soon after 1st April, 1957, as possible.

Applications, stating age, education, qualifications, and experience, together with the names of 2 referees, should reach the undersigned not later than 23rd March, 1957.

P. H. CONSTABLE, House Governor.

ST. GILES' HOSPITAL, Camberwell, S.E.5. House SURGEON (casualty duties, with some general surgical, E.N.T., and Eye beds). Recognised pre-registration post.

Applications, with copy testimonials or names of referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. Part-time CLINICAL ASSISTANT (E.N.T.) required for either 2 or 4 sessions per week. 2 outpatients and 2 operating sessions. Salary £175 p.a. per session.

Applications, in writing, stating age, qualification, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address. (0166.)

ST. JAMES' HOSPITAL, Balham, London, S.W.12. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Post recognised for D.A. and F.F.A.R.C.S. Vacant mid-April.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 23rd March. (0167.)

ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. HOUSE SURGEON (obstetrics and gynæcology). Post recognised for D.Obst.R.C.O.G. in Obstetrics. Appointment commences 1st May, 1957, is resident, and is limited to 6 months.

Applications by 22nd March, 1957, on forms obtainable from the Hospital Secretary. (L.199.)

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified registered practitioners for the post of Locum RESIDENT ANÆSTHETIST (graded Senior House Officer), for the period 27th March–31st May, inclusive.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 16th March, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified practitioners for the post of non-resident Whole-time REGISTRAR in General Medicine. The successful candidate will be required to undertake work in the Casualty and Outpatient Departments as well as having certain inpatient duties. The appointment will be for a first period of 12 months, with effect from 30th May, 1957.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 26th March, 1957.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Senior HOUSE PHYSICIAN (Senior House Officer). General medicine including chest diseases. Non-resident. Immediate vacancy.

Applications, naming 2 referees, to Medical Superintendent.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON, vacant 5th June, 1957, for 6 months. Recognised for the M.R.C.O.G.

Application forms from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of OBSTETRIC HOUSE SURGEON. Recognised for the M.R.C.O.G. Appointment is for 6 months from 7th June, 1957.

Applications to Secretary.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. RESIDENT HOUSE SURGEON (general and gynæcology) required 12th April. Pre-registration candidates considered.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 16th March.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. Applications are invited for the post of SURGICAL REGISTRAR, falling vacant on 1st July, 1957. The appointment is whole-time, non-resident, and is graded as that of a Senior Registrar.

Full particulars and form of application which must be returned not later than Monday, 8th April, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th June, 1957, for a HOUSE PHYSICIAN (Senior House Officer).

Further particulars and form of application, which must be returned not later than 8th April, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE PHYSICIAN (post-registration) in the Paediatric Department at above Hospital. Post recognised for D.C.H. and vacant 1st April, 1957.

Application forms from the Hospital Secretary to be returned by 18th March, 1957.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE.

OBSTETRICAL HOUSE OFFICER, British Hospital for Mothers and Babies, Samuel-street, Woolwich. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Approved for Pre-registration Service. Vacant 1st May.

HOUSE SURGEON (gynæcology and obstetrics), Memorial Hospital, Shooters Hill, Woolwich. Recognised for M.R.C.O.G. (6 months gynæcology). Small Obstetric Unit providing good experience. Vacant mid-April.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOSPITAL. JUNIOR HOUSE OFFICER (surgical) required immediately. Resident.

Applications, stating age and experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cards.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. Locum ORTHOPÆDIC REGISTRAR required immediately.

Applications, giving full details of experience and names of 2 referees, to Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiology (whole-time, non-resident) required at above Hospital. Possession of a radiological qualification essential. Successful candidate required to work part-time at another hospital in the Group. Post vacant 1st April, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 26th March, 1957.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for general surgical duties. 6 months appointment, vacant 1st April, 1957. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required at Ashton-under-Lyne General Hospital.

Applications, with copies of 2 testimonials, to Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancs.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. SENIOR HOUSE OFFICER in Accident and Orthopædic Surgery and Children's Surgery. Recognised for F.R.C.S.

Apply, with 2 recent testimonials, to Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. HOUSE OFFICER in Accident and Orthopædic Surgery and Children's Surgery. Recognised for F.R.C.S. Pre-registration post but registered practitioners invited to apply.

Apply, with 2 recent testimonials, to Secretary-Superintendent.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment; the post can be taken up immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (819 Beds.) CENTRAL WIRRAL GROUP. 3 HOUSE OFFICERS (general surgery) for pre-registration posts, 6 months commencing immediately. Salary according to previous posts held.

Applications to Hospital Secretary, with details of experience, &c., and names of 3 referees.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (819 Beds.) CENTRAL WIRRAL GROUP. SENIOR HOUSE OFFICER (obstetrics and gynæcology) for unit of 54 Beds. Salary according to previous posts held.

Application forms obtainable from Hospital Secretary, to be returned as soon as possible.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post) vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Locum ANÆSTHETIC REGISTRAR required early March, pending new appointment; probably for 4 weeks.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BURTON UPON TRENT. THE GENERAL HOSPITAL. Pre-registration HOUSE OFFICER (general surgery) required at the above Hospital which is recognised for the F.R.C.S.

Applications to Group Secretary as soon as possible.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Coventry Group No. 20, Stoney Stanton-road, Coventry**

REGISTRAR (orthopædic and general surgery) for Manor Hospital, Nuneaton (125 Beds). Recognised F.R.C.S. Experience specialty essential. Resident. Furnished flat available.

(2) **Highcroft Hall Group 7, Highcroft Hall Hospital, Birmingham, 23**

REGISTRAR (psychiatry). All modern forms of treatment. Opportunities for outpatient clinic work. Recognised for D.P.M. House available.

(3) **Dudley Stourbridge Group, The Guest Hospital, Dudley**

(*a*) REGISTRAR (general surgery) at Guest Hospital. Experience specialty essential. Higher qualification desirable. Resident.

(*b*) REGISTRAR (anæsthetic) for Wordsley Hospital (478 Beds). Experience specialty essential. Higher qualification desirable. Married accommodation available.

(4) **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

REGISTRAR (psychiatry) for Shelton Mental Hospital. Previous experience general medicine desirable. Whole-time.

(5) **Burton-on-Trent Group, General Hospital, Burton-on-Trent**

REGISTRAR (surgical), whole-time, vacant 1st April, 1957. Duties at Burton-on-Trent General Hospital. Experience in surgery essential. F.R.C.S. desirable. Hospital recognised for F.R.C.S. Resident.

(6) **Walsall Group, Walsall General Hospital, Walsall**

REGISTRAR (general medicine). Group appointment (resident) for duties mainly at Manor Hospital. Experience specialty essential.

(7) **South Worcester Group, Castle-street, Worcester**

REGISTRAR for St. Wulstan's Hospital, Malvern (230 Beds), whole-time, resident. Good training general medicine required. Hospital mainly for pulmonary tuberculosis with 30 Beds for thoracic surgery.

Applications from Group Secretaries to be returned by 18th March, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) 2 Whole-time SENIOR PSYCHIATRIC REGISTRARS. Duties at All Saints' Hospital (1385 Beds) and Uffculme Early Treatment Centre, Birmingham. May be required to reside in hospital when on duty. Experience specialty and D.P.M. required.

(*b*) SENIOR REGISTRAR in Psychiatry. Duties at Hollymoor Hospital and Psychiatric Outpatient Clinic, Selly Oak Hospital, Birmingham. Hospital linked with Birmingham University for research in psychiatry and biochemistry. D.P.M. and considerable experience in psychiatry essential.

(*c*) Whole-time SENIOR REGISTRAR in Radiology, Selly Oak Hospital, Birmingham (1059 Beds). Diploma in Diagnostic Radiology essential. Department serves large general hospital and group of subsidiaries (including children's, maternity, eye and E.N.T.) and provides experience throughout whole range of specialty.

Successful candidates may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals under the interchange scheme agreed between the 2 Boards.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 25th March, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of MEDICAL REGISTRAR (Registrar grade). The appointment which is tenable for 1 year in the first instance will be served as Resident Medical Officer at the General Hospital and subject to satisfactory review a second year will be spent in a Medical Unit of the Queen Elizabeth Hospital. Candidates should have the M.R.C.P. (London).

Forms of application may be obtained from, and should be returned not later than 16th March, 1957, to the Secretary, The United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to work in the Clinical Pathological Department, vacant 12th June, 1957, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital.

Forms of application may be obtained from the House Governor and should be returned to him by 6th April, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant now. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant staff. 6 months appointment, some of which can be spent in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator within 7 days.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male/Female), vacant 1st April, 1957. Recognised for D.C.H., includes duties on infectious diseases wards, Neonatal Department, and clinics.

Apply Physician-Superintendent.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (955 equipped beds.) ASSISTANT CASUALTY OFFICER (Senior House Officer). Post vacant 1st April, 1957. Resident or non-resident. Recognised for F.R.C.S.

Applications, giving qualifications, experience, age, and copies of 3 recent testimonials, to the Medical Superintendent.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of a RESIDENT SENIOR HOUSE OFFICER (surgical) for the above Hospital of 340 Beds, including a new Surgical Unit of 56 Beds. This is a new post which will become available towards the end of March and is consequent upon the upgrading of the Hospital. There is no emergency surgery undertaken at the moment, but the successful applicant will attend surgical outpatient sessions at the Royal Victoria Hospital.

Applications to the Hospital Secretary, Christchurch Hospital.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (516 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery). Duties include care of cases from London Hospital Orthopædic Department. First, second, third or pre-registration post; tenable for 6 months. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. SENIOR HOUSE OFFICER for duties in the E.N.T. Department of the above Group (78 Beds), vacant mid-March. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with the names of 2 referees, to be sent to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) HOUSE SURGEON required immediately. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 2 HOUSE PHYSICIANS required beginning of April and May. Pre-registration.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer), non-resident, required at the above Hospital. Vacant now. Recognised for F.R.C.S.

Applications, stating usual particulars and the names of 2 referees, to the Administrative Officer.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required for duties at Frenchay Hospital and at Cossham Memorial Hospital. Resident appointment, unmarried accommodation only. Post vacant 25th May, 1957. Tenable for 1 year. Recognised under R.C.S. Fellowship regulations.

Applications, naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol, by 21st March, 1957.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM, near CANTERBURY. JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required at this Mental Hospital. Salary scale £775–£1075 p.a. Single accommodation is available. The post offers experience in all branches of psychiatry, including all forms of modern treatment and outpatients clinics. The Hospital has a high admission-rate and is recognised for the D.P.M.

Apply to the Physician-Superintendent.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) E.N.T. AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant end of March, 1957. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR REGISTRAR in the E.N.T. Department at the Cardiff Royal Infirmary, to commence as soon as possible.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. WHITCHURCH HOSPITAL. (800 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female) from practitioners who have held general house appointments. Opportunities exist for gaining experience in all branches of psychiatry. Salary according to Whitley scale, less £150 p.a. if resident.

Forms of application to be obtained from the Physician-Superintendent, to whom they should be returned, together with the names of 2 referees.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. PÆDIATRIC HOUSE OFFICER (not pre-registration). Duties in sick children's wards and Neo-natal Department. Post recognised for D.C.H. Successful applicant will be required to start on 10th April.

Apply immediately, giving age, qualifications and experience, with copies of recent testimonials and names of referees, to the Secretary.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (General Childrens' Hospital of 700 Beds.) HOUSE PHYSICIAN (Senior House Officer) required, care of acute medical, rheumatism and poliomyelitis Beds.

Applications, stating age, qualifications and experience, together with copies of 3 testimonials, should reach the Group Secretary by 16th March, 1957.

CARSHALTON, SURREY. QUEEN MARY'S HOS-PITAL FOR CHILDREN. (A General Children's Hospital of 700 Beds.) HOUSE SURGEON (House Officer), resident, required for 6 months (3 months general surgery, 3 months E.N.T. and orthopædics). Applicants must have completed 12 months Pre-registration Service.

Applications, stating age and qualifications, together with 1 recent testimonial and the names of 2 referees, should be submitted to the Group Secretary immediately.

CHELMSFORD. ST. JOHN'S HOSPITAL. House PHYSICIAN (pre-registration, first, second or third appointment), Male or Female, to commence 25th March, 1957.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be received not later than 18th March by the Secretary, Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER in Medicine required, working under supervision of Consultant Physicians with main duties in Geriatric Unit (150 Beds), St. Richard's Hospital (400 Beds). Facilities available for investigation and treatment of acute and chronic disease, pre-admission assessment, and follow-up clinic. Resident or non-resident. National Health Service terms and conditions of service. Salary £775–£50–£1075 p.a.

Applications, stating age, nationality, qualifications, and experience, and naming 2 referees, to Group Secretary, 174, Broyle-road, Chichester.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Also recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant immediately.

Apply to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar status) vacant 14th May next for 1 year in first instance. Hospital recognised for F.R.C.S. Salary £850 first year, less £170 p.a. for residence.

Forms of application from Group Secretary, 174, Broyle-road, Chichester.

CLACTON AND DISTRICT HOSPITAL, Clacton-on-Sea. (58 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER. ESSEX COUNTY HOSPITAL. (185 Beds.) Applications invited for post of SENIOR HOUSE OFFICER to Casualty and E.N.T. Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coven-TRY. SENIOR ASSISTANT (Junior Hospital Medical Officer grade) for accident and orthopædic wards. Appointment for 1 year in first instance, renewable annually up to 4 years. Recognised F.R.C.S. Previous experience desirable. Resident accommodation available.

Applications to Hospital Secretary.

CROYDON GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR CASUALTY OFFICER (Registrar status). Post vacant 21st May, 1957. Busy department. Post recognised for Final F.R.C.S. examination. Hospital may be visited on application to Hospital Secretary.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, Croydon General Hospital, London-road, Croydon, to be returned within 14 days.

CROYDON GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Thoracic Medicine tenable for 2 years required at Croydon Chest Clinic. Duties will be mainly at the Croydon Chest Clinic and associated Chest Beds (111 Beds, including beds for non-tuberculous chest conditions), and the successful applicant will work under the direction of the Consultant Chest Physician. Applicants should have wide experience in treatment of tuberculosis and other diseases of the chest. Higher qualification will be an advantage. The clinic may be visited by direct arrangement with the Consultant Chest Physician.

Application forms obtainable from G. A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 14 days.

DERBY. CITY HOSPITAL. (256 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th March, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. CITY HOSPITAL. (260 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th March, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th March, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and becomes vacant in mid-March, 1957. 4 residents on staff. Salary £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second, or third post), required now. Casualty, general surgery, orthopædics, and some gynæcology. Approved pre-registration post. Fully qualified practitioners may apply.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (casualty). Post now vacant.
HOUSE OFFICER (surgical), pre-registration. Post now vacant.

Apply, Group Secretary, Guest Hospital, Dudley.

EDINBURGH. CHALMERS HOSPITAL. Applications are invited from registered or pre-registration medical practitioners for appointment of RESIDENT HOUSE SURGEON in the Gynæcological Annexe of the Hospital, for 6 months commencing 1st April, 1957, entailing responsibility for 24 gynæcological beds and 19 children's surgical beds.

Applications, stating age, qualifications and experience, and names of 2 referees, to be sent immediately to the Secretary, Edinburgh Central Hospitals, 1, Rillbank-terrace, Edinburgh, 9.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT ANÆSTHETIST required for Eastern General Hospital, commencing on 1st April, 1957. Salary scale £425–£525 p.a. This post is recognised for the Diploma in Anæsthetics.

Applications, with names of 2 referees, to the Medical Superintendent, Western General Hospital, Edinburgh, 4.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Temporary REGISTRAR required in Department of Anæsthesia from 8th April, 1957, for not less than 9 months. Post is recognised for D.A. and F.F.A.R.C.S., and affords a wide experience in practical anæsthesia and tuition under Consultant supervision.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEONS (2 pre-registration posts), vacant 22nd March and 26th April, 1957. Duties with General Surgical Unit, doing some genito-urinary work. Recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

EPPING. ST. MARGARET'S HOSPITAL. Resident SENIOR HOUSE OFFICER (surgery), vacant 25th March, 1957. Post recognised for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 15th March, 1957.

EPSOM, SURREY. ST. EBBA'S HOSPITAL. St. Ebba's AND BELMONT GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR at above Hospital. The Hospital (865 Beds) is principally concerned with the treatment of voluntary cases of good prognosis and has over 1300 admissions annually. There are full facilities for psychological and physical investigations and all modern treatment methods are used. The Hospital has Outpatient Departments and a special unit for juvenile psychiatric cases. Tutorials are given by senior staff in preparation for the D.P.M. and every assistance is given to staff to attend London neurological clinics. Full residential amenities are available. Candidates may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms should be returned to him within 2 weeks of the appearance of this advertisement.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR, North Cambridgeshire and Clarkson Hospitals, Wisbech (271 Beds). Post provides experience in general medicine, pædiatrics and geriatrics, also facilities for study. Flat available near hospitals. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 18th March, 1957. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, North Cambs Hospital, Wisbech.

EAST GRINSTEAD. QUEEN VICTORIA HOSPITAL. (PLASTIC SURGERY AND JAW INJURIES UNIT.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required immediately. Appointment for 6 months, offering considerable opportunity to gain experience in plastic surgery and jaw injuries work.

Applications, stating age, and the names of 3 referees, to Hospital Secretary.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR in General and Genito-urinary Surgery required at above Hospital. Post vacant 28th May, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 19th March, 1957.

GAINSBOROUGH. JOHN COUPLAND HOSPITAL. (40 Beds.) LINCOLN NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER which will become vacant on 1st April, 1957. The Hospital has a number of both medical and surgical beds. Salary is in accordance with Junior Hospital Medical Officer grade of the terms laid down for hospital medical and dental staffs. Married quarters are available.

Applications, giving full particulars, should be forwarded as soon as possible to R. W. HOWICK, Group Secretary.

County Hospital, Lincoln.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 15th April and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. Locum REGISTRAR (surgery) required 3rd April–29th May, 1957.

Applications to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HERTFORD COUNTY HOSPITAL. (173 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence immediately.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HORNCHURCH. ST. GEORGE'S HOSPITAL, Ingre-BOURNE CENTRE. Temporary PSYCHIATRIC REGISTRAR required at above Neurosis Unit. Mental Hospital experience essential. Candidate should be specially interested in short-term psychotherapy and social psychiatry. Further information may be obtained from the Hospital which may be visited by arrangement (Tel.: Hornchurch 4181).

Applications, stating names of 2 referees, should be sent to Group Secretary, Oldchurch Hospital, Romford.

HOVE GENERAL HOSPITAL, Sussex (75 Beds. 3 Resident Medical Officers.) Pre-registration HOUSE SURGEON (with casualty duties) required 1st April, 1957, for 6 months. Post is recognised for F.R.C.S. Salary £425–£525, less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, full details of experience, together with names and addresses of 2 referees, to the Administrative Officer.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (252 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital, to commence duties on 25th March, 1957. The Hospital caters for chronic sick, children, maternity and acute medical and surgical patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, £775–£50–£1075. House available for married candidate.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) Applications are invited for the post of CASUALTY OFFICER. The post, which is resident, is recognised under the Fellowship regulations and will be graded either Junior Hospital Medical Officer or Senior House Officer according to experience. Duties terminate at 7 P.M. with 1 night weekly on call.

Applications for the appointment, which will be vacant on 1st April, 1957, should be accompanied by copies of 3 recent testimonials and addressed to—

H. J. JOHNSON, Group Secretary.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required commencing duties immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration post), resident, and tenable for 6 months. This post includes gynæcology, E.N.T., and general surgery.

Applications, with 2 recent testimonials, to the Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (100 Beds for infectious diseases, pulmonary tuberculosis, and long-stay orthopædics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea Road Wing), Ipswich.

JOHNSTONE, RENFREWSHIRE. I.D. HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (tuberculosis) required. Applicants must be fully registered medical practitioners for at least 1 year.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the post of RESIDENT REGISTRAR (Male or Female). Unfurnished house or flat in hospital grounds available for married applicants; furnished quarters for single persons. Hospital recognised for D.P.M. and facilities provided for attending courses of instruction at neighbouring universities. All modern methods of investigation and treatment carried out; successful candidate required to work under supervision of Consultant Psychiatrists by rotation, both for inpatient and outpatient work.

Apply Medical Superintendent.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications invited for the post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Unfurnished flat available for married applicants; furnished quarters for single persons. Hospital recognised for D.P.M. and facilities granted for attending neighbouring universities. All modern methods of investigation and treatment carried out; outpatient clinics: Hospital serving North Lancashire and Lake District. Post for initial period of 4 years, but renewable if services satisfactory.

Apply Medical Superintendent.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) RESIDENT SENIOR HOUSE OFFICER (orthopædics). The successful applicant will work with an Orthopædic and Traumatic Specialist Unit. The post, vacant on 1st April next, is recognised for F.R.C.S.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

LLANELLY HOSPITAL, Llanelly. (164 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Surgical Unit of 75 Beds. The post offers excellent experience in general surgery and the Hospital is recognised under the F.R.C.S. regulations.

Full particulars, stating age, experience and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

LLANELLY HOSPITAL, Llanelly. (164 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, experience, and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

LIVERPOOL, 9. WALTON HOSPITAL. Applications are invited for the following posts in orthopædic surgery.

SENIOR HOUSE OFFICER,
HOUSE OFFICER,

which will be vacant from 1st April, 1957. The latter post is recognised for Pre-registration Service.

Apply in writing to Physician-Superintendent, Walton Hospital, Liverpool, 9, stating age, qualifications, experience and names of 2 referees.

LIVERPOOL REGIONAL HOSPITAL BOARD. Liver-POOL RADIUM INSTITUTE. Applications are invited for the post of SENIOR REGISTRAR in Radiotherapy with duties at the above Hospital. Candidates must possess a Diploma in Radiology, and preference will be given to holders of a higher qualification.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 23rd March, 1957.

VINCENT COLLINGE, Secretary to the Board.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Obstetrics and Gynæcology, Halifax Group of hospitals—duties mainly at Halifax General Hospital (108 obstetric and 41 gynæcology beds). Subject to satisfactory progress the person appointed will be given an opportunity of undertaking at least 1 years training at the Teaching Hospital.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 21st March, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR required for the Radiotherapy Centre. Candidates with D.M.R. preferred. The post will be tenable for 1 year in the first instance and renewable for a second. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous post with dates, with 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, by Wednesday, 13th March, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Medicine

St. James's Hospital, Leeds (206 general medical beds). Duties those of Resident Medical Officer.

Urology

Bradford Royal Infirmary (65 urology beds). Approximately one-fifth of the duties will be general surgical. Non-resident. Post vacant end of June.

Radiotherapy

Regional Radium Institute, Bradford (50 Beds); preferably resident. Unit provides a complete Radiotherapy Service for approximately 1,000,000 population.

General Surgery

(i) St. James's Hospital, Leeds (124 general surgical beds).

(ii) Halifax Group—1 of 3 similar posts. Duties divided between general and orthopædic surgery (180 general surgical and 81 orthopædic beds). May include some duties in the Casualty Department. Preferably resident.

Geriatrics

Bradford A and B Groups. Work primarily with Consultant Geriatrician in the Admission Unit at St. Luke's Hospital with additional duties at Thornton View Hospital. Offers excellent experience of an Area Geriatric Service. Aggregate of 730 Beds.

Pediatrics

Bradford A and B Groups. Duties mainly at Children's Hospital (52 Beds). Resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 14th March, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Senior Regis-TRAR vacancies.

Dermatology

Bradford Royal Infirmary (57 dermatological beds), large Outpatients Department, over 4000 new cases annually. Non-resident.

Ophthalmology

Royal Eye and Ear Hospital, Bradford (34 ophthalmic beds). Any additional duties as may be required at other hospitals in the Bradford A and B Hospital Management Committee Groups. Non-resident.

Child Psychiatry

Person appointed will be under training at the Leeds University Department of Psychiatry and associated clinics and will have experience at the Local Authority Child Guidance Department and at a special school for maladjusted boys.

Radiology

General Infirmary at Leeds (7 notional half-days per week) and the County Hospital, York (4 notional half-days per week).

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 21st March, 1957.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT SENIOR HOUSE SURGEON (not recognised for F.R.C.S.), vacant end of March. This post in small but busy general hospital provides good and varied experience in diagnosis, treatment, and operative procedure.

Applications, stating age, qualifications, and experience, and the names of referees, to be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maiden-HEAD. RESIDENT SURGICAL REGISTRAR required.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 17th March.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant now. Salary at the rate of £425–£525 p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MALVERN. ST. WULSTAN'S HOSPITAL. (230 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Good experience in modern treatment of pulmonary tuberculosis. Work mainly medical but Hospital has own Thoracic Surgical Unit.

Applications to Physician-Superintendent.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR in Orthopædics required from 1st to 19th April, 1957.

Applications, with full details, to the Group Secretary at above address.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant on 1st April, 1957. The Hospital takes part in undergraduate medical teaching, and the post is recognised in obstetrics and gynæcology for M.R.C.O.G. purposes.

An application form should be obtained from the Group Secretary at the Hospital and returned within 7 days of the appearance of this advertisement.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Department which will become vacant in April, 1957 (resident or non-resident). Duties are primarily in the active medical wards. Excellent experience is available in the unit which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER, 9. BOOTH HALL CHILDREN'S HOSPITAL. (380 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Regional Burns Unit (45 Beds for severe burns and scalds). Post vacant. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) HOUSE OFFICER (surgical), pre- or post-registration. Duties mainly general surgery and neurosurgery. Post vacant on 1st April.

Applications, with usual particulars and copies of 2 recent testimonials, to the Group Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. WITHINGTON HOSPITAL, MANCHESTER, 20. The Board invites applications for the post of REGISTRAR in Pathology. Group Laboratory, Withington Hospital (1088 Beds). The laboratory is recognised for the D.Path. examination, and facilities are available for training in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, to arrive not later than 15th March, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of REGISTRAR in General Medicine. National scale and conditions.

Apply, stating age, qualifications, experience and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD AND THE BOARD OF GOVERNORS OF THE UNITED MANCHESTER HOSPITALS. Locum SENIOR REGISTRAR in Diagnostic Radiology with duties at Manchester Royal Infirmary, &c., and at Christie Hospital and Holt Radium Institute, Manchester. Required from April, 1957, until June, 1958. Salary £24 a week.

Applications, giving full particulars of previous appointments and names of 2 referees, to be sent to the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, by 20th March, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Chest Diseases in the Ashton, Hyde and Glossop Group and Oldham and District Group of hospitals. The post offers wide experience in both outpatient clinics and pulmonary hospitals. Residential accommodation may be arranged.

Applications to the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancashire.

MANCHESTER (near). ROYAL MANCHESTER CHILDREN'S HOSPITAL, PENDLEBURY. MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT MEDICAL REGISTRAR vacant 19th March, 1957. Previous experience in paediatrics essential. Preference given to candidates with M.R.C.P. or other higher qualifications. The Hospital is the chief teaching unit of the University Department of Child Health.

Applications to Group Secretary, Salford Royal Hospital, Salford, 3, immediately.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for above Hospital, situated on Great North-road approximately 20 miles from Nottingham. Post offers good experience. The Consultant staff attending Newark Hospital are on 1 or more of the Nottingham Hospitals. During next few months a flat will be available as married quarters, but in meantime single accommodation can be provided. Salary £775–£50–£1075. Duties to commence as soon as possible.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Vacancies 1st April, 1957, for the following :—

HOUSE OFFICER (general surgery). Recognised for F.R.C.S.

HOUSE OFFICER (Department of Anæsthetics). Recognised for D.A.

HOUSE OFFICER (Fracture and Orthopædic Department). Recognised for F.R.C.S.

HOUSE OFFICER (Dermatological Department) (Harborough Road Hospital).

SENIOR HOUSE OFFICER (Casualty Department). Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Department of Pathology).

SENIOR HOUSE OFFICER (Department of Anæsthetics). Recognised for D.A. & F.F.A.R.C.S.

All posts, except those of Anæsthetic House Officer, Dermatological House Officer and Senior House Officer, recognised for pre-registration. All 6 months appointments in first instance.

Applications, enclosing copies of 3 testimonials, as soon as possible, to S. G. HILL, Superintendent.

NORTHAMPTON (near). CREATON HOSPITAL. Applications are invited for the post of HOUSE OFFICER, which is recognised as a pre-registration medical appointment. The Hospital has 138 Beds and is for the treatment of both pulmonary and non-pulmonary tuberculosis. There is a new major Thoracic Surgical Unit for tuberculosis and non-tuberculosis diseases of the chest.

Applications, stating age, experience and qualifications, together with the names and addresses of 2 referees, should be sent to the Secretary, Northampton and District Hospital Management Committee, General Hospital, Northampton.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant 24th March, 1957. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty); duties to commence early March. Establishment 3. Recognised for F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR PSYCHIATRIST (whole-time), St. George's Hospital, Morpeth (1250 Beds). Married or single accommodation available. The person appointed will be able to take the Durham University D.P.M. Course.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Benfield-road, Newcastle upon Tyne, 6, within 21 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Senior REGISTRAR PHYSICIAN (whole-time) for Geriatric Unit, Sunderland Group of hospitals. Appointment for 1 year only. Post suitable for Senior Medical Registrars with a higher qualification requiring experience in geriatrics.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 21 days.

NEWMARKET GENERAL HOSPITAL, Suffolk. Senior HOUSE SURGEON (Senior House Officer grade). Tenable for 6 months in first instance. Duties mainly surgical, but a small amount of E.N.T. and ophthalmic surgery is included. Preference to candidates who wish to be trained in surgical technique and to gain experience in operative surgery.

Applications, with copies of 3 testimonials, to Medical Superintendent.

OLDHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of HOUSE OFFICER (pædiatrics) (recognised for D.C.H.) becoming vacant on 1st April, 1957. The post offers excellent neonatal experience.

Applications, containing details of qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham, quoting Ref. No. F/12.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Orthopædic and Accident Surgery (non-resident) to the hospitals and clinics of the Aylesbury area. The appointment will be for 1 year and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 20th March.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Psychiatry (whole-time) at Fair Mile Mental Hospital, near Wallingford (Berks) and Associated Clinics. Recognised for the D.P.M. Full facilities for training are available in the area department. The appointment will be for 1 year and eligible for extension to a second year. Married accommodation available.

Application forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 20th March, 1957.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in General Medicine, vacant 12th June, 1957.

SENIOR HOUSE OFFICER in Anæsthetics, vacancies 1st April, 1st May, 1957. Recognised for the D.A. and F.F.A.R.C.S. Appointments will be for a period of 12 months.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Royal Portsmouth Hospital**
HOUSE SURGEON. 70 Beds. Pre-registration post. Vacant now.

(2) **Queen Alexandra Hospital** (87 surgical beds)
SENIOR HOUSE SURGEON, vacant 1st April, 1957.

(3) **Queen Alexandra Hospital** (78 medical beds)
HOUSE PHYSICIAN (pre-registration), vacant 15th March, 1957.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH AND ISLE OF WIGHT AREA PATHOLOGICAL SERVICE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Pathology, vacant 1st June, 1957. The successful candidate will be expected to do a tour of duty in the Departments of Bacteriology, Hæmatology, Histology and Biochemistry at the Central Laboratory, and may also be required to work in any of the laboratories covered by the Service. The Laboratory is recognised for the Diploma of Pathology.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, Saint Mary's Hospital, Milton, Portsmouth, which should be returned to him duly completed on or before 15th March, 1957. Canvassing will disqualify. Candidates may visit the Central Laboratory, Milton-road, Portsmouth, by arrangement with the Senior Pathologist.

PAISLEY. ROYAL ALEXANDRA INFIRMARY ANNEXE. JUNIOR HOSPITAL MEDICAL OFFICER (geriatrics) required. Applicants must be fully registered medical practitioners for at least 1 year.

Applications to Group Medica Superintendent, Royal Alexandra Infirmary, Paisley.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEON (pre-registration) required for Orthopædic and Fracture Unit.

Applications to Group Medical Superintendent.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEON (pre-registration) required for general surgery.

Applications to Group Medical Superintendent.

PAISLEY. I.D. HOSPITAL, Hawkhead-road. House PHYSICIAN (pre-registration) required.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. SENIOR HOUSE OFFICER (Male), mainly surgical. Post vacant April.

Apply to the Hospital Secretary.

ROCHFORD. GENERAL HOSPITAL. Applications are invited for the appointment of a SENIOR HOUSE OFFICER (clinical pathology). Post tenable for 1 year and recognised for Diploma in Pathology. Previous experience in pathology not essential but applicants must have good clinical experience. Post vacant mid-March.

Applications, with copies of 2 recent testimonials, to be sent to the undersigned not later than 11th March, 1957.

J. C. FIELD, Secretary.

General Hospital, Rochford, Essex.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEON required from 28th March, 1957, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidate appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in the Obstetric and Gynæcological Unit consisting of 88 obstetric and 52 gynæcological beds. Post recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident appointment of GYNÆCOLOGICAL HOUSE SURGEON at the Royal Berkshire Hospital, Reading. Vacant 1st April and tenable for 6 months. Post recognised for M.R.C.O.G.

Write, stating age and qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of SECOND CASUALTY OFFICER (Senior House Officer grade), with duties in the Fracture and Orthopædic Department. Resident. Post vacant 29th April, 1957. The post is recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach the undersigned by 21st March, 1957. J. C. FIELD, Secretary.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR at Stratheden Hospital, Cupar, Fife. During the tenure of the post opportunities for interchange of duty and training at other centres in the Region may be available under the joint training scheme of the South-Eastern Regional Hospital Board and the Department of Psychological Medicine of the University of Edinburgh. Residence is available.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 30th March.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Medicine in a Teaching Unit at the Eastern General Hospital (Edinburgh Northern Group).

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3 by 30th March.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Pathology based at the Dumfries and Galloway Royal Infirmary, Dumfries.

REGISTRAR in Pathology based at the Glasgow Royal Infirmary for duties on a rotational basis at the Royal Maternity and Women's Hospital.

REGISTRAR in Psychiatry based at Stobhill General Hospital, Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 23rd March, 1957.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of REGISTRAR to the E.N.T. Department. Post recognised for D.L.O. and F.R.C.S.

Application forms obtainable from, and must be returned to, Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (262 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th March, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Applications are invited for the resident (pre-registration) post of HOUSE SURGEON (orthopædics), vacant on 6th April, 1957.

Apply, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the Group Secretary, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. CITY GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (anæsthetics) required at the above Hospital. Recognised for the F.F.A. R.C.S. examination. Post vacant 25th April. Successful candidate to reside in Hospital when "on call." This is a large general hospital (652 Beds) with a Department of Thoracic Surgery, a Regional Cardiological Centre and a Professorial Gynæcological Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th March, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR (psychiatry) required for duties at the Towers Hospital, Leicester, and at the Children's Psychiatric Clinics in Leicester and Leicestershire. Appointment for 1 year in first instance reviewable annually.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 25th March, 1957.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for 2 appointments as SURGICAL REGISTRARS. Both posts are vacant on 15th April, 1957. The successful candidates will work on a rotation basis between the Royal Infirmary and the Children's Hospital. It is intended, if possible, that the holders of the posts will spend equal periods in the Orthopædic Department and on each of 2 surgical firms at the Royal Infirmary ; and for a period at the Children's Hospital.

Applications, stating age, qualifications and experience with the names of 3 referees, should be sent not later than 13th March, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of SENIOR REGISTRAR in Clinical Pathology. Possession of a higher qualification desirable but not essential. The appointment is for 1 year in the first instance and will be reviewed annually. It has been agreed in principle between the Board of Governors of The United Sheffield Hospitals and the Sheffield Regional Hospital Board that the appointment, if extended for the full period, will be divided, subject to the satisfactory work and progress, between The United Sheffield Hospitals and a hospital in the Region (at present the Derbyshire Royal Infirmary).

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 23rd March, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY. ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant immediately.

Applications, with copy testimonials, to Group Secretary Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (216 Beds.) HOUSE PHYSICIAN (pre-registration or otherwise), vacant 24th April, 1957.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised for F.F.A.R.C.S. Registrar also employed. Vacant immediately.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. ST. FRANCIS AND HURSTWOOD PARK HOSPITALS, HAYWARDS HEATH, SUSSEX. PSYCHIATRIC REGISTRAR required at above Mental Hospital and Neuropsychiatric Unit. In addition to the neurological and psychiatric facilities of these hospitals, trainees may attend the practice of the Mental Health Department in Brighton, the Brighton Observation Ward, and the Brighton Child Guidance and Adult Outpatient Clinics. Married and single accommodation available. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, 11, Portland-place, W.1, not later than 23rd March, 1957.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) 2 RESIDENT HOUSE PHYSICIANS required in April. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) CASUALTY OFFICER (Senior House Officer grading), required beginning April.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions: patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for duties mainly in the Paediatric Department. Post vacant approximately 17th April, 1957. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (Psychiatrist), resident or non-resident, for 1 year in the first instance, at Shenley Hospital, 16 miles from London. Opportunity for work with neurotic as well as psychotic patients. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds. Recognised for F.F.A.R.C.S. and D.A.). **STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER in Anæsthetics. Post vacant 1st April, 1957. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar who shares in emergency duties.

Applications, with copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the appointment of SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon, vacant on 14th March. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Nuffield Orthopædic Centre (Wingfield Morris Orthopædic Hospital), Oxford, includes large number of industrial injuries. Salary £750 p.a., less £150 p.a. for residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, Wilts, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. ST. MARGARET'S HOSPITAL, STRATTON. Applications invited for post of RESIDENT SENIOR HOUSE OFFICER for Paediatric Unit. Post recognised for D.C.H., permits time for postgraduate study; vacant 31st March.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, Wilts, as soon as possible.

SUTTON, SURREY. BANSTEAD HOSPITAL. Applications are invited for the post of Locum Tenens PSYCHIATRIC REGISTRAR immediately. Accommodation available for single person, charge for full residential amenities £3 5s. 2d. a week. Salary £17 10s. a week.

Applications should be sent to the Physician-Superintendent.

SWANSEA HOSPITAL, Swansea. (403 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Pre-registration HOUSE OFFICER in the Surgical Unit of the above Hospital. Immediate vacancy.

Applications, with full particulars, should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

STOCKPORT. STEPPING HILL HOSPITAL. (535 Beds.) Applications are invited from candidates having had experience in obstetrics, for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology). This post is recognised for M.R.C.O.G. and is vacant 1st April, 1957. There are 72 obstetric and 40 gynæcological beds.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Locum SENIOR HOUSE OFFICER (anæsthetics) required 10th–23rd March.

Applications, with copies of 2 testimonials, to Secretary.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Locum Tenens RESIDENT SURGICAL OFFICER (Senior House Officer grade) required from 1st April, 1957. Salary £14 10s. per week. A charge at the rate of £150 p.a. will be made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., to—

W. BOWRING, Group Secretary,
Victoria Chambers, Wood-street, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Fully registered Locum Tenens HOUSE OFFICER required from 1st April, 1957, in the General Surgical Department. Salary £9 10s. per week. A charge at the rate of £125 p.a. will be made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., to—

W. BOWRING, Group Secretary,
Victoria Chambers, Wood-street, Wakefield.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Modern Department employing 3 full-time Casualty Officers. Post recognised for F.R.C.S. Resident or non-resident. Vacant April.

Applications, with names of 2 referees, to the Administrator.

WEAVERHAM, CHESHIRE. HEFFERSTON GRANGE SANATORIUM. (162 Beds—Pulmonary Tuberculosis.) RESIDENT SENIOR HOUSE OFFICER required.

Applications to Secretary at the above address, with names of 2 referees, as soon as possible.

WESTCLIFF HOSPITAL, Balmoral-road, Westcliff-on-Sea, ESSEX. (111 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade). Post vacant 9th April, 1957. The Hospital deals with communicable diseases and general medicine. The appointment covers a wide field of medicine and offers excellent training for general practice.

Applications should be sent to the undersigned at the General Hospital, Prittlewell-chase, Southend-on-Sea, not later than 20th March, 1957. J. C. FIELD, Secretary.

WIGAN (near). WRIGHTINGTON HOSPITAL. Senior HOUSE OFFICER required (resident or non-resident). 74 Beds for pulmonary tuberculosis. 267 Beds for orthopædic tuberculosis. Salary and board charges in accordance with national scale.

Apply to Secretary with 2 references.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant 4th April.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required (Senior House Officer grade). Department forms part of Accident Service of Windsor Group. Duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WOLVERHAMPTON GROUP. New Cross Hospital. RESIDENT SENIOR HOUSE OFFICER required. Geriatric Department of 260 Beds. This post may become Junior Hospital Medical Officer later. Consultant Geriatrician recently appointed and active inpatient treatment and outpatient clinics are being started.

Applications to Group Secretary, The Royal Hospital, Wolverhampton.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (627 Beds.) Pre-registration HOUSE OFFICER in Medicine, vacant 14th April, 1957.

Applications to the Secretary.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (627 Beds.) Pre-registration HOUSE OFFICER in Surgery, vacant 16th April, 1957.

Applications to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) HOUSE SURGEON (pre-registration post), vacant now.

Applications, with copies of testimonials, to Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) HOUSE OFFICER (pre-registration), E.N.T. Department, recognised for the D.L.O. and F.R.C.S. examinations, vacant now.

Applications, with copies of testimonials, to Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of ANÆSTHETIC REGISTRAR in the above Group (Southlands Hospital, 411 Beds; Worthing Hospital, 210 Beds). Vacant from 6th June, 1957. Post is recognised for the D.A. and F.F.A.R.C.S.

Forms of application are obtainable from the undersigned and should be returned within 14 days from the appearance of this advertisement. A. V. OAKTON, Group Secretary,

Worthing Group Hospital Management Committee.

129, Brighton-road, Worthing, Sussex.

WORTHING HOSPITAL, Lyndhurst-road, Worthing. (Acute General—210 Beds.) The vacancy of HOUSE SURGEON will occur on 1st April, 1957.

Applications from either registered medical practitioners or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary,

Worthing Group Hospital Management Committee.

YORK. CITY HOSPITAL. (General—256 Beds, with full Consultant staff.) HOUSE OFFICER (pre-registration or registered) or Locum SENIOR HOUSE OFFICER in General Surgery required immediately.

Applications, stating age, qualifications, experience, names of 2 referees, to Group Secretary, Bootham Park, York.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in Clinical Pathology at hospitals managed by the Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 30th March, 1957.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for 2 posts of REGISTRAR or SENIOR REGISTRAR in Medicine at this Teaching Hospital which is in special relationship with the University of London. The successful candidates will be required to commence duties in May and October, 1957. 1 of the appointments is for 18 months and the other for 1 year, and the salaries will be within the scales £900–£100–£1100 : £1200–£100–£1500 p.a. depending on previous experiences and qualifications. If available, an unfurnished flat will be provided at a rental of 5% of salary, otherwise, a living-out allowance of up to £200 p.a. for a married person, £150 for a single person will be granted. Return passages from and to the country of recruitment are provided for the appointee but not for wife and family.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital of the West Indies, Mona P.O., Jamaica, B.W.I., to whom applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, should be sent not later than 22nd March, 1957.

CANADA. REDDY MEMORIAL HOSPITAL, Tupper-street, WESTMOUNT, MONTREAL. RESIDENT in Pathology required at earliest possible date. 2 or more years experience desirable with emphasis on tissue pathology. Salary $2700–$3600 p.a. depending on experience and qualifications. Appointment initially for 1 year, but could be extended by mutual agreement.

Apply, giving full details and names of 2 referees, to Executive Director.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. CHILDREN'S DEPARTMENT. SENIOR REGISTRAR (1 of 2). The Board of Management invite application from medical practitioners with the requisite postgraduate experience and qualifications for the above post in the almost completed teaching hospital.

The salary offered for the post is: £1428 p.a. rising by 3 annual increments to £1596 p.a. plus an inducement addition payable to an expatriate doctor of £300 p.a.

Successful candidate will be asked to assume duty about June, 1957, when it is expected that the department will be established in the new Teaching Hospital

The appointment will be initially for 1 tour of 12 months and will be renewable, by mutual agreement for a further tour of 12 months. On satisfactory completion of the agreement a gratuity of £37 10s. will be paid for each completed term of 3 months service. An outfit allowance of £60 is payable on first appointment. Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement allowance, and the officer appointed will be eligible for 7 days leave on full pay for each completed month of service in Nigeria. Free first-class passages are provided for expatriate doctors and their wives on first appointment and on completion of their agreement. Free first-class passages to Nigeria, will in certain circumstances, be provided for non-expatriate doctors. Free first-class passages will be provided on vacation leave. Successful candidates will be eligible for children's allowance in accordance with current regulations. Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions and details of the revised salary and gratuity in such cases will accompany application forms.

Applications should be submitted not later than 23rd March, 1957, on the appropriate forms which will be forwarded together with additional information on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

IOWA, U.S.A. IOWA METHODIST HOSPITAL, Des MOINES, IOWA. 400-Bed General Community Hospital fully approved for resident training in all specialties. Also have opportunities for 1-year INTERNS. U.S.A. citizenship and licensure not required. Stipend $175 per month, plus full maintenance for Physician; apartment available for family.

Apply Administrator.

Public Appointments

CROYDON. COUNTY BOROUGH OF CROYDON. ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Applications are invited for this established appointment from registered medical practitioners having at least 3 years experience after qualification, for duties mainly in the School Health and Maternity and Child Welfare Services. Possession of the D.P.H. or D.C.H. will be an advantage. Salary within the scale £1050–£50–£1200–£55–£1475 p.a.

Application forms (from the Medical Officer of Health, 45, Wellesley-road, Croydon), must be returned to him not later than 23rd March, 1957. E. TABERNER, Town Clerk.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Position vacant. OBSTETRICIAN-GYNÆCOLOGIST, Galway County Council. Essential qualifications include (i) at least 7 years experience at least 4 of which were devoted mainly to obstetrics and gynæcology, (ii) M.A.O., M.R.C.O.G., M.R.C.P.I. in Obstetrics and Gynæcology, or equivalent. Salary £1775 with permission to engage in private practice. The person appointed will be allowed the use of certain beds and may undertake, if offered, a University teaching appointment.

Application forms and particulars from the Secretary of the Commission, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 29th March, 1957.

GENERAL BOARD OF CONTROL FOR SCOTLAND. DEPUTY PHYSICIAN-SUPERINTENDENT (Psychiatrist) at State Mental Hospital and State Institution for Mental Defectives, Carstairs, Lanarkshire. The Board invite applications for the post (Senior Hospital Medical Officer status) of Deputy Physician-Superintendent at the above Hospital (110 Beds) and Institution (170 Beds). Candidates must be fully qualified and registered medical practitioners with previous psychiatric experience. A house will be available. Salary £1575–£2025.

Application forms (which must be returned by 30th March, 1957) can be obtained from Secretary (Room 30), General Board of Control for Scotland, St. Andrew's House, Edinburgh, 1.

GOVERNMENT OF THE FEDERATION OF RHODESIA AND NYASALAND. MINISTRY OF HEALTH. Vacancy: LEPROLOGIST. Applications are invited from medical practitioners interested in the diagnosis, treatment and care of leprosy for a post as Leprologist in the Federal Public Service. Salary: fixed rate £2550 p.a. The successful applicant will be appointed in the first instance to take charge of the Luapula Leprosy Settlement in Northern Rhodesia.

Application forms and further details from Secretary (R), Rhodesia House, 429, Strand, London, W.C.2. Closing date 30th March.

GOVERNMENT OF NORTHERN RHODESIA. Medical OFFICER required for Silicosis Medical Bureau. Duties include clinical and radiological examination of miners (European and African). Officer will be stationed at Kitwe and will work under supervision of Chairman (a Medical Specialist) of the Silicosis Medical Bureau. Kitwe is a town of considerable size with agreeable climate and many social amenities. Post offers excellent opportunity for experience in diseases of chest and research in pneumoconiosis. Appointment on permanent basis with pension, or short-term contract with gratuity (taxable). Candidates from National Health Service may retain superannuation rights (up to 6 years) and receive gratuity (taxable) of 20% of aggregate of salary at end of engagement. Salary scale £1245–£2030 a year, starting salary depending upon age and experience. Pension for permanent appointment at rate of 1/600th o :final pensionable emoluments for each completed month of service. Gratuity for contract appointment £37 10s. for each completed 3 months of service. Free passages provided in both directions for Officer and wife, and assisted passages for children. Housing available and married candidates may take family. Candidates (Male only) should be aged 25–35, possess medical qualifications registrable in United Kingdom and have had at least 12 months postgraduate experience.

Application forms from Director of Recruitment, Colonia Office, London, S.W.1 (quoting No. BCD. 117/3/02).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. Medical OFFICER required in North Borneo for general clinical work in tropical and other diseases, maternity and child welfare, promotion of public and rural health and sanitation, with limited administrative duties. Must be prepared, if necessary, to perform emergency surgery, attend midwifery cases, and travel to outlying places (in district to which posted). Candidates should possess qualifications registrable in United Kingdom and have had at least 1 years postgraduate hospital experience; D.T.M. & H. desirable but not essential. Appointment on permanent basis with pension (non-contributory) 1/600th of final pensionable emoluments for each completed month of pensionable service. Salary scale, including inducement pay, £1428–£2324 a year. In addition, married officers with 1 or more dependent children under 18 years receive allowance of 7½% of salary with a maximum of £140 a year, and an education allowance of £140 a year for each of up to 2 children between 5 and 18 years educated outside North Borneo. Quarters provided at low rental. Free passages for Officer, wife and up to 3 children under 18 years of age. Generous leave. Income-tax at local rates.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/21/04).

MID-WARWICKSHIRE JOINT SANITARY COMMITTEE AND WARWICKSHIRE COUNTY COUNCIL. DEPUTY MEDICAL OFFICER OF HEALTH AND ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified medical practitioners for the post of Deputy Medical Officer of Health to the Mid-Warwickshire Joint Sanitary Committee and Assistant County Medical Officer of Health to the Warwickshire County Council which posts together constitute a whole-time appointment, the time being allocated equally between the Mid-Warwickshire Joint Sanitary Committee and the County Council. The officer appointed must hold the Diploma in Public Health. The inclusive salary will be at the rate of £1412 18s. 4d. p.a., rising to a maximum of £1813 10s. 10d. p.a. by the following annual increments: 3 of £58 15s., 1 of £61 17s. 6d., 1 of £59 7s. 6d., and 3 of £34 7s. 6d., for convenience the increments of the 2 appointments have been added together. In addition, travelling and subsistence allowances will be payable in accordance with the scales adopted by the County Council. The appointment will be made by the Mid-Warwickshire Joint Sanitary Committee, and the successful applicant will subsequently be appointed by the Warwickshire County Council as an Assistant County Medical Officer of Health for the administrative County of Warwick with duties in connection with the health and school medical services of the County Council. The Joint Sanitary Committee is comprised of the following local authorities—the Boroughs of Royal Leamington Spa and Warwick, the Urban District of Kenilworth, the Rural Districts of Southam and Warwick. The appointment of Deputy Medical Officer of Health to the Joint Sanitary Committee is subject to the Sanitary Officers (Outside London) Regulations, 1935 and 1951. Temporary accommodation in a Council house in Leamington Spa is available to the successful applicant for a reasonable period to give him the opportunity of securing alternative accommodation.

Conditions of appointment may be obtained from the undersigned by whom applications must be received not later than 30th March, 1957. T. W. H. WATKISS,
Clerk of the Mid-Warwickshire Joint Sanitary Committee.
23, Waterloo-place, Leamington Spa, March, 1957.

MINISTRY OF LABOUR AND NATIONAL SERVICE. MEDICAL BOARDS AND DISABLEMENT ADVISORY COMMITTEES. From time to time vacancies occur in the panels of medical practitioners who are prepared to serve, as required, as members of National Service Medical Boards. Such Boards meet at intervals according to the requirements of the area and payment is on a sessional basis. A General Practitioner wishing to be considered for any vacancy which might arise in the panel of the Medical Board nearest to the district in which he resides, should make his wish known to the appropriate Local Medical Committee or to the Secretary, Ministry of Labour and National Service, Baynards House, 1–13, Chepstow-place, Westbourne-grove, London, W.2.

Occasional vacancies also occur in the membership of that Department's Disablement Advisory Committees and their Panels. Membership of a Disablement Advisory Committtee is unpaid but service on Panels is remunerated on a sessional basis. A General Practitioner wishing to be considered for such appointments should similarly apply to his Local Medical Committee or the Secretary, Ministry of Labour and National Service, 32, St. James's-square, S.W.1, though there is a waiting list at present for the London area.

MINISTRY OF SUPPLY ESTABLISHMENT, near SALISBURY, WILTS. PHARMACOLOGIST/TOXICOLOGIST required. Qualifications: first or second class honours degree in a biological science with at least 3 years postgraduate research experience including some in a branch of pharmacology or toxicology. Knowledge of statistical methods would be an advantage. Appointment according to age, experience, &c., as Senior Scientific Officer (minimum age 26). Salary within range £1075–£1265 (superannuable).

Forms from M.L.N.S., Technical and Scientific Register (K), 26, King-street, London, S.W.1, quoting G49/7A. Closing date 30th March, 1957.

PERTH AND KINROSS COUNTY COUNCIL. Applications invited for the appointment of SENIOR ASSISTANT MEDICAL OFFICER from Male registered medical practitioners with D.P.H. or equivalent and with general public health experience. Salary on scale £1150–£1575 with placing.

Full particulars and forms of application from the County Clerk, County Offices, Perth. Applications to be lodged by 25th March, 1957.

WESTERN REGION OF NIGERIA. Specialist ANÆSTHETISTS required. Duties mostly at Adeoyo Hospital, Ibadan, but will include sessions at other Government hospitals in the Region. Candidates must possess medical qualifications registrable in United Kingdom, F.F.A.R.C.S. or equivalent and at least 6 years post-registration experience in full-time Anæsthetist appointments.

Appointments may be:—
(*a*) From National Health Service, candidates retaining superannuation rights up to 6 years and receiving gratuity (taxable) of 20% of aggregate of salary; or
(*b*) On short-term contract (1 tour in first instance of 12–24 months duration according to age).

Salary under (*a*) £2220 a year, and (*b*) £2664 and gratuity (taxable) on satisfactory completion of contract at rate of £37 10s. for each completed period of 3 months service (including leave). Officers appointed under (*b*) required to contribute to Widows' and Orphans' Pension Scheme.

Quarters provided at low rental. Taxes at loca rates. Annual leave permissible: generous home leave granted after each tour of 18–24 months. Free return passages for Officer, wife, and children (up to 3).

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/410/028).

U.S.A.

MENTAL HOSPITAL PHYSICIANS.—These positions involve the performance and supervision of medical care and administrative services for patients in a 2800-Bed mental hospital in the Shenandoah Valley of Virginia. Merit increases, vacation, and sick leave with pay, retirement benefits.

STAFF PHYSICIAN.—2 years of psychiatric experience, at least 1 of which must have been in a mental hospital; licence to practise medicine in State or eligibility therefor; starting salary $8784 per year.

JUNIOR PHYSICIAN.—Graduate from a recognised medical college supplemented by 1 year of rotating internship in an approved hospital; licence to practise medicine in State or eligibility therefor; starting salary $8400 per year.

Apply for the above positions to Superintendent, Western State Hospital, Staunton, Virginia, U.S.A.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
FRIOCKHEIM ..	ANGUS ..	23RD MARCH, 1957

LINDSEY COUNTY COUNCIL. Health Department. Applications invited from fully qualified medical officers for post of ASSISTANT SCHOOL MEDICAL OFFICER for Scunthorpe area of Lindsey. Salary in accordance with award of Industrial court regarding salaries of Assistant Medical Officers—i.e., £1050 p.a., rising by annual increments of £50 to £1200 then by increments of £55 to maximum of £1475 p.a.

Further particulars and forms of application obtainable from undersigned. C. D. CORMAC, County Medical Officer.
P.O. Box 26, County Offices, Lincoln.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. SENIOR MEDICAL OFFICER (maternal and child welfare). Applications are invited for the above appointment from registered medical practitioners (Women) holding a Diploma in Public Health and having had extensive experience in maternal and child welfare, and general public health work. The salary will be on the Whitley Council scale £1520–£50–£55 (7)–£1955. The person appointed will be responsible, under the direction of the Medical Officer of Health, for carrying out the administrative duties of the Maternal and Child Welfare Section of the Public Health Department and any such duties as the Medical Officer of Health may from time to time determine. The appointment will be subject to the provisions of the National Health Services (Superannuation) Regulations, 1947, and the successful candidate will be required to pass a medical examination.

Applications (no forms) in envelopes endorsed, "Senior Medical Officer (Maternal and Child Welfare)," together with copies of 3 recent testimonials or names of 3 referees, to be delivered to the Medical Officer of Health, Public Health Department, St. Peter's Chambers, Glebe-street, Stoke-on-Trent, not later than 16th March, 1957.

HARRY TAYLOR, Town Clerk.

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER. Applications invited from registered medical practitioners (Men or Women) for this appointment. The duties will chiefly concern School Health and Child Welfare Services. D.C.H. or D.P.H. an advantage. Salary, travelling and subsistence allowances on national scale. Additional £200 p.a. paid for occasional duties during the absence of the Medical Officer of Health for Halesowen and Stourbridge Boroughs and Medical Superintendent of the Hayley Green Isolation Hospital.

Application forms from County Medical Officer, County Buildings, Worcester. (S.20.)

Hospital Services: Non-Medical Appointments

NOTTINGHAM NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from persons holding an appropriate science degree or the A.R.I.C. for the appointment of BIOCHEMIST within the Nottingham No. 2 Group of Hospitals. The person appointed will work under the direction of the Chemical Pathologist at the City Hospital where there is a fully equipped Biochemical Laboratory. Salary in accordance with experience and qualifications, based on Whitley Council scales within the range of £475–£845.

Applications, stating experience and qualifications, together with the names of 2 persons to whom reference can be made, should be sent to J. H. HARGREAVES, Group Secretary.
Sherwood Hospital, Hucknall-road, Nottingham.

Miscellaneous

Bournemouth. Well-equipped Nursing-home registered 23 patients (medical, surgical, acute). Enviable position close town centre. Renowned goodwill. Offers region £13,000 including valuable freehold and contents prior auction.—RUMSEY & RUMSEY, Auctioneers, Bournemouth.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

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	Vitamin B_1	3 mg.
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	Manganese Glycerophosphate	½ gr.
	Strychnine Glycerophosphate	8/200 gr.

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